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IN THE UNITED STATES DISTRICT COURT
FOR THE WESTERN DISTRICT OF TEXAS
WACO DIVISION

VLSI TECHNOLOGY LLC *
*
VS. * CIVIL ACTION NO. W-21-CV-57
*
INTEL CORPORATION * February 24, 2021

BEFORE THE HONORABLE ALAN D ALBRIGHT, JUDGE PRESIDING
JURY TRIAL PROCEEDINGS
VOLUME 3 OF 7

APPEARANCES:

For the Plaintiff:

Morgan Chu, Esq.
Benjamin W. Hattenbach, Esq.
Alan Heinrich, Esq.
Ian Robert Washburn, Esq.
Amy E. Proctor, Esq.
Dominik Slusarczyk, Esq.
Charlotte J. Wen, Esq.
Jordan Nafekh, Esq.
Babak Redjaian, Esq.
Irell & Manella, L.L.P.
1800 Avenue of the Stars, Suite 900
Los Angeles, CA 90067-4276

J. Mark Mann, Esq.
Andy W. Tindel, Esq.
Mann, Tindel & Thompson
112 East Line Street, Suite 304
Tyler, TX 75702

For the Defendant:

William F. Lee, Esq.
Joseph Mueller, Esq.
Louis W. Tompros, Esq.
Felicia H. Ellsworth, Esq.
Jordan L. Hirsch, Esq.
WilmerHale
60 State Street
Boston, MA 02109

Mary V. Sooter, Esq.
Amanda L. Major, Esq.
Wilmer Cutler Pickering Hale Dorr LLP
1225 17th Street, Suite 2600
Denver, CO 80202

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J. Stephen Ravel, Esq.
Kelly Hart & Hallman LLP
303 Colorado Street, Suite 2000
Austin, TX 78701

James Eric Wren, III, Esq.
Baylor University Law School
One Bear Place #97288
Waco, TX 76798-7288

Court Reporter: Kristie M. Davis
United States District Court
PO Box 20994
Waco, Texas 76702-0994

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08:45 1 (February 24, 2021, 8:45 a.m.)

08:45 2 THE BAILIFF: All rise.

08:45 3 THE COURT: Thank you. You may be seated.

08:45 4 Good morning, ladies and gentlemen. My understanding is
08:45 5 we have a couple of issues to take up. I apologize. I had
08:45 6 another hearing I had to get done this morning. I couldn't get
08:45 7 in here soon enough. I apologize.

08:45 8 Yes, sir?

08:45 9 MR. HATTENBACH: Good morning, Your Honor. One of the
08:46 10 issues we wanted to raise is Intel has a witness, Mr. Douglas.
08:46 11 The issue is he was never disclosed as an expert, no expert
08:46 12 report, no expert deposition. And last night we received these
08:46 13 demonstratives which include a large physical board with a
08:46 14 bunch of moveable --

08:46 15 THE COURT: He's not going to go today, is he?

08:46 16 MR. HATTENBACH: He may. I think it depends on how
08:46 17 quickly the proceedings move.

08:46 18 MR. MUELLER: I think it's unlikely, Your Honor.

08:46 19 THE COURT: I thought yesterday we thought that there
08:46 20 would just be one Intel witness that we got to today. And so
08:46 21 just for the sake of time and getting started, if I could take
08:46 22 this one up later, either today or tonight or whatever. I've
08:46 23 got it. I'll take it up, but I don't want to take up the time
08:46 24 right now.

08:46 25 MR. HATTENBACH: Okay. That's fine. I think he is their

08:46 1 first witness.

08:46 2 MR. MUELLER: He's not. It's Mr. King.

08:47 3 MR. HATTENBACH: Thank you, Your Honor.

08:47 4 THE COURT: See, I'm paying attention.

08:47 5 MR. HATTENBACH: Appreciate it.

08:47 6 THE COURT: Yes, sir, Mr. Lee.

08:47 7 MR. LEE: Thank you, Your Honor. I think there are two
08:47 8 things that if I could ask Your Honor to consider --

08:47 9 THE COURT: Sure.

08:47 10 MR. LEE: -- that need to be considered this morning.

08:47 11 One is with Mr. Stolarski. We were informed last night
08:47 12 about 11 o'clock that he has left the jurisdiction.

08:47 13 Mr. Stolarski has been the corporate representative at all the
08:47 14 hearings before Your Honor, introduced to the jurors at voir
08:47 15 dire, jury selection, introduced to the jury. He was disclosed
08:47 16 as a witness. They disclosed him.

08:47 17 THE COURT: Did you subpoena him?

08:47 18 MR. LEE: We did not subpoena him. He's on the will call
08:47 19 list.

08:47 20 THE COURT: Well, Mr. Lee, I hate --

08:47 21 MR. LEE: But, Your Honor, actually I'm not -- if I could
08:47 22 suggest what we think we need to do, if that's all right with
08:47 23 Your Honor, I asked yesterday at 5 o'clock whether he was going
08:48 24 to testify because Your Honor had asked the question. I was
08:48 25 told yes.

08:48 1 Now, if I'd been told no, I would have issued a subpoena.
08:48 2 But since he's left the jurisdiction, we will have to amend our
08:48 3 deposition disclosures to add disclosures to him. We will
08:48 4 argue the empty chair, which Your Honor would expect. We will
08:48 5 offer -- we will make a proffer to Your Honor on Fortress,
08:48 6 because we now are in a circumstance where --

08:48 7 THE COURT: I haven't ruled on -- I haven't -- you all
08:48 8 have not done anything with respect to Fortress during the
08:48 9 trial. I haven't decided if Fortress is in or out.

08:48 10 MR. LEE: And look, Your Honor, I'm not suggesting that
08:48 11 you either have the power or should order him to come back.
08:48 12 I'm not suggesting that I want to subpoena him if he's left the
08:48 13 jurisdiction.

08:48 14 THE COURT: But I just want to take up -- you know, I had
08:48 15 an issue during the opening with Fortress because of the
08:48 16 conflict and what I was hearing about their role in the case
08:49 17 and all that, and because the opening argument is just argument
08:49 18 and it's not evidence.

08:49 19 I haven't -- Intel has not addressed the Fortress issue at
08:49 20 all as far as I could tell, in asking to be allowed to bring it
08:49 21 in as an evidentiary issue. And so when you say you're going
08:49 22 to make a proffer on it, I haven't ruled that it's not coming
08:49 23 in.

08:49 24 MR. LEE: We understand, Your Honor. And so our intention
08:49 25 had been to put it in through Mr. Stolarski, who was going to

08:49 1 be the second or fifth witness, depending on the disclosure.

08:49 2 Since he's not here any longer, I wanted to offer Your Honor

08:49 3 our position so it was clear as soon as the issue arose.

08:49 4 We will supplement our deposition designations from both

08:49 5 this case and Delaware. There was cross use for this. We will

08:49 6 argue the presence or absence of a witness. The one thing I

08:49 7 don't want to have happen is to have someone get up in closing

08:49 8 and provide an explanation for why he's here if it's not part

08:50 9 of the evidentiary record. And I think that would be --

08:50 10 THE COURT: Let's take that up down the road.

08:50 11 MR. LEE: Yeah -- inappropriate.

08:50 12 And the Fortress evidence would have been put in through

08:50 13 Mr. Stolarski. So the reason we're going to make the proffer

08:50 14 to Your Honor is so you can have it at the same time we give

08:50 15 you the deposition designations for him.

08:50 16 THE COURT: Is it not in the deposition?

08:50 17 MR. LEE: It is in the deposition.

08:50 18 THE COURT: Okay. So, well, then I'll -- Mr. Chu, are you

08:50 19 opposed to him using the deposition?

08:50 20 MR. CHU: Of course we're not -- excuse me. Trying to get

08:50 21 to a mic.

08:50 22 THE COURT: Yes, sir.

08:50 23 MR. CHU: We're in favor of using depositions, but not

08:50 24 related to Fortress for reasons --

08:50 25 THE COURT: I get that.

08:50 1 MR. CHU: Right.

08:50 2 THE COURT: And so --

08:50 3 MR. CHU: So if they -- they had designated a lot of
08:50 4 Mr. Stolarski's deposition previously. And we don't have a
08:51 5 blanket objection to their using, if appropriate and relevant
08:51 6 and meeting the normal rules, Mr. Stolarski's deposition.

08:51 7 THE COURT: Okay. So, Mr. Lee, it sounds to me like the
08:51 8 issue that we have -- we have a couple of issues that aren't
08:51 9 ripe yet.

08:51 10 One is, because Mr. Chu says you're going to -- he's not
08:51 11 going to object, and I wouldn't -- if he did, I would overrule
08:51 12 it. But you're using the deposition since he's not here. I
08:51 13 get that.

08:51 14 When you go to put on the -- when you go to call that, it
08:51 15 doesn't seem to me like it makes much difference when you -- in
08:51 16 the order that you play that deposition. Maybe it does to you,
08:51 17 I don't know. But it seems to me like I can take up the part
08:51 18 of the deposition that relates to Fortress immediately before
08:51 19 you -- when the jury's not in here.

08:51 20 If you'll -- we probably have it, but if you'll get the
08:51 21 section just on Fortress that you care about, that you will
08:52 22 want to have admitted, if you'll get that to Evan in a discrete
08:52 23 way -- I don't want the whole depo -- but if you can get us
08:52 24 just the section that you want to put in, and that Mr. Chu is
08:52 25 going to object to coming in, so I can read it in advance. And

08:52 1 then you all can argue about whether or not it's admissible.

08:52 2 MR. LEE: Yeah. We'll do that, Your Honor.

08:52 3 I think the likelihood now is to play his deposition
08:52 4 closer to the end of our case so we have some time. I wanted
08:52 5 to raise it with Your Honor because the issue has just arisen,
08:52 6 and it will require us to supplement our deposition
08:52 7 designations.

08:52 8 THE COURT: You'll be permitted to do so. I'm not giving
08:52 9 you -- I'm not saying one way or the other about the
08:52 10 admissibility of Fortress, but in terms of your ability to --
08:52 11 I'm not going to hear them say it's too late for you to
08:52 12 supplement now because you anticipated being able to call him
08:52 13 and he's not here.

08:52 14 And so I'm -- I've been in your shoes, Mr. Lee. I have --
08:52 15 everything that's going on here I have experienced myself. So
08:53 16 I understand exactly what's going on in the middle of trial.
08:53 17 And you may supplement your deposition of him, the transcript
08:53 18 that you want to play, in any manner you seek. And at
08:53 19 someplace on Friday, I guess, where -- what is today?

08:53 20 MR. LEE: Today's Wednesday. I think sometime Friday we
08:53 21 can get to it.

08:53 22 THE COURT: We can do it tomorrow, you know. This may be
08:53 23 the best time. As of right now, I think the best time for you
08:53 24 all -- for us to do the jury charge is tomorrow evening after
08:53 25 the trial. If it weren't for your schedule, Mr. Lee, I would

08:53 1 probably put it off until like Monday morning and do it and
08:53 2 then have the closing arguments. But I don't want to waste
08:53 3 that time for you if you need to get out of here.

08:53 4 MR. LEE: I appreciate it, Your Honor, only because the
08:53 5 other hearing is starting.

08:54 6 THE COURT: Right. And so I will -- we'll do the jury
08:54 7 charge either tomorrow night, or possibly at worst, Friday
08:54 8 night after trial. But we won't take up any daytime time doing
08:54 9 the jury charge.

08:54 10 And what I'm saying is if we do the jury charge tomorrow
08:54 11 night, we may as well wrap in the Fortress issue as well. And
08:54 12 I'll see what's in the deposition, and you can argue why it
08:54 13 should come in. Mr. Chu can argue why it should stay out. And
08:54 14 I'll make a ruling, and you'll be able to play it on Friday.

08:54 15 MR. LEE: And, Your Honor, what we might accompany the
08:54 16 deposition designations with this is just -- what I called the
08:54 17 proffer -- it's just a very short brief -- it says: Given
08:54 18 what's occurred during the evidence, here's why we should offer
08:54 19 it. So you'll at least have our argument.

08:54 20 THE COURT: Well, you don't need a proffer yet.

08:54 21 MR. LEE: Okay.

08:54 22 THE COURT: I would suggest you wait to offer -- you're
08:54 23 being way too pessimistic. I don't know what I'm going to do,
08:54 24 but you'll only need the proffer if I decide to exclude it.

08:54 25 MR. LEE: Fair enough.

08:54 1 THE COURT: Also, and it may very well be when I see what
08:55 2 he said in the deposition, I may allow some of what he said
08:55 3 about Fortress in and not other things. I'll have to read what
08:55 4 he said to make that decision.

08:55 5 MR. LEE: Fair enough.

08:55 6 Your Honor, for Dr. Sullivan, who we will get to this
08:55 7 morning, a few things. One is in his demonstratives he has a
08:55 8 new opinion. He has a per-unit royalty, \$1 per unit. It's
08:55 9 nowhere in his expert reports.

08:55 10 When we raised the issue, we were told it's just math. If
08:55 11 you do the math, you'd come up with a number. But that's --
08:55 12 everything on the damages end "it's just math." It's an
08:55 13 entirely new number.

08:55 14 THE COURT: Well, let me ask you this because I haven't
08:55 15 heard -- I didn't hear during opening what the number was.
08:55 16 We're all -- all of America's waiting to find out the answer to
08:55 17 that question with rapt attention.

08:55 18 But my sense from the beginning has been -- my sense from
08:55 19 the opening argument was that it was essentially going to be --
08:55 20 work out to be about \$1 per unit, was --

08:56 21 MR. LEE: Your Honor, that's not in any expert report.

08:56 22 THE COURT: Okay.

08:56 23 MR. LEE: Not once.

08:56 24 THE COURT: Well, if -- here's -- I'm just going to have
08:56 25 to deal with this as it -- here's my problem. I'm a big: Has

08:56 1 to be in the expert report, but if -- I'm just going to make
08:56 2 this up -- if it turns out that -- I'm just making these
08:56 3 numbers up -- if it turns out that Intel sold one and a half
08:56 4 billion allegedly infringing units, and Dr. Sullivan says the
08:56 5 amount of damages is \$1.5 billion, and Mr. Chu says, "what does
08:56 6 that work out to be?" And he says, "it's \$1 per unit." In
08:56 7 that sense, to me that is just math.

08:56 8 Now, what I would not -- that would not bother me. If it
08:56 9 was the other direction, and he was saying how did you get to
08:57 10 the number? I thought the right number was \$1 and they sold
08:57 11 1.5 billion, and that was not disclosed in the report, then
08:57 12 that I would have a concern about. Does that make sense?

08:57 13 MR. LEE: Your Honor, and this is -- I apologize for
08:57 14 taking more time, but I think this is an important part of my
08:57 15 making the record.

08:57 16 THE COURT: Yes.

08:57 17 MR. LEE: There is a fundamental difference between what
08:57 18 he did and a per-unit royalty. And responding to a per-unit
08:57 19 royalty and identifying the problems with even your -- the
08:57 20 first part of your analogy, which is 1.5 divided by 1.5, there
08:57 21 is a separate attack on the legitimacy of that type of royalty.

08:57 22 We have not had a chance to respond to it, because it
08:57 23 wasn't in his report. It is a separate analytical framework.
08:57 24 It is a separate legal framework.

08:57 25 And to have him now do this on the third day of trial for

08:57 1 the first time under the guise of "it's just math," it's not
08:58 2 just math. We would have a full-throated response as to why
08:58 3 this was not right.

08:58 4 And Your Honor will recall that one of your motions in
08:58 5 limine was to exclude evidence of royalty stacking. Believe
08:58 6 me, if they did a per-unit royalty, you would have heard a ton
08:58 7 about the royalties we're paying now and royalty stacking.

08:58 8 THE COURT: Well, here's what we're going to do. I'm not
08:58 9 going to rule, so don't -- I'm not going to hear from VLSI at
08:58 10 this point because I'm not going to rule right now. When we
08:58 11 get to that point of Dr. Sullivan's direct where they want
08:58 12 to -- where VLSI wants to use that slide, we'll take a break.
08:58 13 I'll hear what the questions are going to be from counsel to
08:58 14 Dr. Sullivan and his answers. And then I'm going to ask the
08:58 15 plaintiff to show me what in his report prior to this time
08:59 16 supports him being able to say that.

08:59 17 MR. LEE: Fair enough.

08:59 18 THE COURT: If it's in the report, if I decide it is,
08:59 19 he'll get to testify about it. If I decide that it's not, then
08:59 20 he won't.

08:59 21 MR. LEE: Fair enough, Your Honor.

08:59 22 THE COURT: So the burden's on VLSI when they get to this
08:59 23 point to say, you know, Judge, this would be a good time to
08:59 24 take a break. I'll understand what that means. I'll excuse
08:59 25 the jury, and we'll take up -- this is an issue I can't decide

08:59 1 kind of out of context.

08:59 2 MR. LEE: No. Certainly these issues are, as we did
08:59 3 yesterday with the 1006 issue, it's just to alert you to the
08:59 4 issue so it doesn't pop up while the jury's sitting there.

08:59 5 Just a couple others we can do quickly. There are a
08:59 6 series of demonstratives that -- where Dr. Sullivan picks
08:59 7 numbers out, big numbers, research and development numbers,
08:59 8 total revenue numbers.

08:59 9 Your Honor has ruled on that in Rule No. 7 and said those
08:59 10 numbers should be out. We have said that for the exhibits that
08:59 11 have them in, you know, we'll work with the other side to
09:00 12 redact what shouldn't come in under Your Honor's ruling, but to
09:00 13 allow what should come in that is critical to his analysis.

09:00 14 But the slides that he has now, and just to alert you
09:00 15 because I will be objecting to them, they have these other
09:00 16 numbers that have nothing to do with his analysis other than
09:00 17 the fact they're big numbers from, as Your Honor knows from
09:00 18 your own experience, SEC reports, annual reports of a whole
09:00 19 host of numbers, there's a bunch of demonstratives that have
09:00 20 those in and so we would be objecting to those so Your Honor
09:00 21 knows.

09:00 22 THE COURT: Are those numbers in his report?

09:00 23 MR. LEE: The documents are in his report, but that was
09:00 24 before Your Honor's MIL ruling on what would come in and
09:00 25 wouldn't and before we had the argument on the entire market

09:00 1 value rule and the 403 issues.

09:00 2 THE COURT: Let me hear from counsel for VLSI, and I'm
09:00 3 presuming you don't want to put something in I ruled on in a
09:00 4 MIL -- well, let me start over.

09:00 5 The point of the MIL is to have you come to me before you
09:01 6 put it in, and it's not actually a ruling that it's
09:01 7 inadmissible.

09:01 8 Let me ask you -- try it this way. Is this something --
09:01 9 and, Mr. Lee, I want you to -- I want you to weigh in on this
09:01 10 as well. Is this something that you can show the demonstrative
09:01 11 and, Mr. Lee, you can object at that time and I can see from
09:01 12 what is happening in the questioning of whether or not I think
09:01 13 it should be admissible or not?

09:01 14 MILs are typically to keep something out that where just
09:01 15 the prejudice of showing it to the jury would be so profound
09:01 16 that, you know, I can't just rule on the relevance of it as we
09:01 17 go.

09:01 18 What -- let me ask you what you think about that and then
09:01 19 I'll hear from Mr. Lee. It seems to me this is something I can
09:01 20 probably deal with as you show the demonstrative. I hear the
09:01 21 context of what you're asking, and Mr. Lee can object.

09:02 22 MS. PROCTOR: I think that's fine, Your Honor. I would
09:02 23 love to hear from Mr. Lee what specific demonstratives he's
09:02 24 concerned about because the SEC filing demonstratives we've
09:02 25 submitted do not include any of the big numbers. They just

09:02 1 include statements about the competition in the market.

09:02 2 THE COURT: Well, what would certainly make me happy going
09:02 3 forward is if someone has a concern with someone else's
09:02 4 demonstratives, if they make sure the other side knows which
09:02 5 demonstratives those are. So, Mr. Lee, if you have not favored
09:02 6 VLSI with which demonstratives you are unhappy about, I would
09:02 7 do that.

09:02 8 MR. LEE: We did last night, Your Honor.

09:02 9 MS. PROCTOR: And I'm so -- I'm not sure which ones you're
09:02 10 referring to now because there are none -- I'm sorry, Your
09:02 11 Honor. I'm not sure which ones he's referring to now because
09:02 12 there are none with the large numbers that relate to SEC
09:02 13 filings, and we also offered to submit just selected pages from
09:02 14 the SEC filings into evidence, and we've prepared those
09:02 15 redacted versions that we would be happy to submit in place of
09:02 16 the full SEC filings.

09:02 17 THE COURT: Okay. Well, here's what I'm going to do.

09:03 18 Mr. Lee, this seems to me to be something we can deal with
09:03 19 as Dr. Sullivan's testifying. You can object to them, and I'll
09:03 20 see in the context of the question and answer whether or not I
09:03 21 think they should come in as evidence or not.

09:03 22 MR. LEE: That's fine, and to the extent there's any
09:03 23 ambiguity, I'll rescind the list of the ones that we are
09:03 24 objecting to because there'll be some time when Dr. Annavaram's
09:03 25 on the stand.

09:03 1 THE COURT: Okay.

09:03 2 MS. PROCTOR: And one other comment I wanted to make, Your
09:03 3 Honor, just on the per unit versus the overall numbers, I know
09:03 4 you're going to address that later. We understand your ruling.
09:03 5 We'll happily go through and show you how Dr. Sullivan
09:03 6 disclosed a running royalty in his report and that's always
09:03 7 been the form of royalty, but I want to make sure that the
09:03 8 Court is aware. Intel's also objecting to our use of the total
09:03 9 accused revenues which you ruled on during the MIL phase and
09:03 10 said that those can come in. The issue is those numbers are
09:03 11 for one patent 50 billion, for another patent 123 approximately
09:04 12 billion dollars.

09:04 13 And so in order for us to show the math of Dr. Sullivan's
09:04 14 calculation, we have to use those 50 billion or \$123 billion
09:04 15 numbers or we have to divide, just simple division like Your
09:04 16 Honor said, the total royalty by the total number of units and
09:04 17 do it on a per-unit basis.

09:04 18 So it's the exact same math. I'm happy to show you the
09:04 19 slides and show you the support in the report, but I want to be
09:04 20 clear that this is an issue that's been brought on actually by
09:04 21 Intel's objections and their -- basically they said we can't
09:04 22 use the big numbers. They think that's prejudicial so we've
09:04 23 tried to adjust and use the small ones.

09:04 24 THE COURT: Well, when Dr. Sullivan tries to move forward,
09:04 25 I'll decide whether he can use the big numbers or the method

09:04 1 he's using to not use the big numbers, but I'll understand it
09:04 2 better if I hear Dr. Sullivan's testimony.

09:04 3 MS. PROCTOR: Absolutely, Your Honor. And we'll show you
09:04 4 the calculations both ways, and we think both are admissible.

09:04 5 THE COURT: Okay. Mr. Lee?

09:04 6 MR. CHU: Go ahead.

09:04 7 MR. LEE: Last issue with Dr. Sullivan, Your Honor, he has
09:05 8 a series of slides to show the hypothetical negotiation as
09:05 9 between Intel and NXP. It's between Intel and Freescale at the
09:05 10 time of the hypothetical negotiation of the date.

09:05 11 This is something Your Honor addressed in part in the
09:05 12 opening slides. They just need to be correct on who the
09:05 13 parties are to the hypothetical negotiation.

09:05 14 THE COURT: I definitely agree that it should be between
09:05 15 Freescale and Intel.

09:05 16 MR. LEE: Thank you, Your Honor.

09:05 17 MS. PROCTOR: And I'm sorry. Very briefly on that, Your
09:05 18 Honor. It's very clear on our slides -- sorry -- it's clear on
09:05 19 our slides that it would be between Freescale and Intel.
09:05 20 That's what Dr. Sullivan will say. We've just put NXP's logo
09:05 21 next to Freescale to remind the jury of the relationship
09:05 22 between the companies now and the merger.

09:05 23 THE COURT: Why don't we take NXP off? Because I think it
09:05 24 does need to be made clear.

09:05 25 You can -- he can certainly say that, but I think it's

09:05 1 fair to Intel that the jury understand that even -- it might be
09:05 2 NXP now, but the negotiation would have been between Freescale
09:06 3 as it stood at the time and Intel as it stood at the time and
09:06 4 NXP's -- and the relationship between Freescale and NXP is --
09:06 5 there's no relevance to that for the hypothetical negotiation.

09:06 6 MS. PROCTOR: Understood, Your Honor.

09:06 7 THE COURT: As I understand hypothetical negotiations and
09:06 8 who knows how well I do so... anything else, Mr. Chu?

09:06 9 MR. CHU: Yes. At the end of the day yesterday, promised
09:06 10 to get back to the Court about the time. And Suzanne's time
09:06 11 keeping and your rounding up is perfectly fine and consistent
09:06 12 with our time keeping.

09:06 13 Second, I wanted to give -- share with Your Honor a short
09:06 14 report on written discovery, but more importantly on deposition
09:06 15 designations, and then third, we are going to read in the list
09:06 16 of the exhibits that we thought were admitted.

09:06 17 So my neutral report without faulting either side, there
09:06 18 have been designations and counter-designations. I'm not sure
09:07 19 they're all complete. They may be largely complete, but I
09:07 20 think both sides have objections, and we will work with Intel's
09:07 21 counsel to get you those objections as soon as possible.

09:07 22 I want to confirm that the running time in the deposition
09:07 23 is charged against the party who had designated that.

09:07 24 THE COURT: Correct.

09:07 25 MR. CHU: Okay. And what is the Court's preferred way to

09:07 1 get you the objections? Would it be for us to just to mark it
09:07 2 on the deposition transcripts or in some other way?

09:07 3 THE COURT: I think -- here's what I would do. If you
09:07 4 just give me the portions of the transcript and highlight the
09:07 5 portions that one side's objected to, I've done this long
09:07 6 enough where I'm not going to really pay attention to what your
09:07 7 objections are. I'm just going to read through it, and I'll
09:07 8 know -- I think I'll be able to figure it out. If I have a
09:07 9 question, I'll say, why are you objecting to this, but I think
09:07 10 I can read those pretty quickly and decide whether or not I
09:08 11 think they're objectionable.

09:08 12 MR. CHU: So we'll work with Intel's counsel, try and get
09:08 13 those to you as quickly as possible, but it may be that we
09:08 14 don't get all or everything to you today in time so that --

09:08 15 THE COURT: That's fine.

09:08 16 MR. CHU: Okay. And then there may be some written
09:08 17 discovery we want to read to the jury. So it may be --

09:08 18 THE COURT: Responses to interrogatories and that sort of
09:08 19 stuff?

09:08 20 MR. CHU: Yes, responses to written discovery.

09:08 21 THE COURT: Okay.

09:08 22 MR. CHU: So it may be when we have called our last
09:08 23 witness that we formally will not have rested subject to the
09:08 24 items I just discussed.

09:08 25 THE COURT: Understood.

09:08 1 MR. CHU: And then my colleague, Mr. Heinrich, will do a
09:08 2 superb job of reading exhibit numbers.

09:08 3 THE COURT: Well, he did a fine job on his direct
09:08 4 yesterday. I expect nothing less today.

09:08 5 MR. HEINRICH: And I won't go too fast. PTX-0007,
09:09 6 PTX-0227, PTX-1588-NAT, PTX-1669, PTX-1669-NAT, PTX-1670-NAT,
09:09 7 PTX-1696-NAT, PTX-1802, PTX-1805, PTX-1949-NAT, PTX-1979-NAT,
09:09 8 PTX-3481, PTX-3484, PTX-3494, PTX-3511, PTX-3523, PTX-3574,
09:09 9 PTX-3579, PTX-3588, PTX-3588-NAT, PTX-3628, PTX-3638,
09:10 10 PTX-3641-NAT, PTX 3659, PTX-3662, PTX-3662-NAT, PTX-3695,
09:10 11 PTX-3845, PTX-3851, PTX-4375, PTX-4396, D-1065, D-1145 and
09:10 12 D-1154. The last three were excerpts from source code files.
09:10 13 Does Intel agree?

09:10 14 MR. MUELLER: I think there was four of them that we did
09:10 15 not understand to be admitted. What I would suggest, Your
09:10 16 Honor, if we could with Your Honor's permission confer with
09:11 17 VLSI's counsel and at lunch perhaps let you know the final
09:11 18 numbers.

09:11 19 THE COURT: Absolutely.

09:11 20 MR. MUELLER: Thank you, Your Honor.

09:11 21 THE COURT: And that's why we do this. I mean, I want to
09:11 22 be on the same page as to what's been admitted.

09:11 23 Is there anything else we need to take up before I bring
09:11 24 in the jury?

09:11 25 MR. CHU: No, Your Honor.

09:11 1 MR. LEE: No, Your Honor.

09:11 2 THE COURT: Okay. If you all will get ready and if you
09:11 3 can bring your witness up, I'll step back, we'll bring in the
09:11 4 jury and we'll be in in a few seconds.

09:13 5 THE BAILIFF: All rise.

09:13 6 THE COURT: Please remain standing for the jury.

09:13 7 (The jury entered the courtroom at 9:13.)

09:14 8 THE COURT: You may be seated.

09:14 9 Yes. It's always fascinating to me to see how you move
09:14 10 during the week. Do you put on more clothes, do you put on
09:14 11 less clothes, is it hot in here, is it not hot in here. I wear
09:14 12 this and so I can never tell what the temperature in here
09:14 13 really is for you all sitting here. Welcome back.

09:14 14 Counsel, you may proceed with your direct.

09:14 15 MR. WASHBURN: Good morning. Things ended a little
09:14 16 quickly yesterday. I don't think I got a chance to introduce
09:14 17 myself. My name is Ian Washburn. It's nice to meet you.

09:14 18 DIRECT EXAMINATION

09:14 19 BY MR. WASHBURN:

09:14 20 Q. And good morning, Professor Annavaram.

09:14 21 A. Good morning.

09:14 22 Q. Now, I'm not going to qualify you again, but just
09:14 23 because there was a lot of technical testimony yesterday, could
09:14 24 you briefly remind the jury who you are?

09:14 25 A. Just in case you forgot, my name is Murali Annavaram.

09:15 1 I am a professor at USC.

09:15 2 Q. And did you prepare any slides for your presentation
09:15 3 today, professor?

09:15 4 A. Yes. I have prepared a few slides so that you can
09:15 5 follow along as I describe some of the technology-related
09:15 6 issues.

09:15 7 Q. All right. Now, just to situate us before we get to
09:15 8 your opinions, could you explain to the jury using your slides
09:15 9 if you like what your role is on this case?

09:15 10 A. My role in this case is to quantify the benefits.
09:15 11 Basically, you heard Professor Conte with respect to what the
09:15 12 infringing technologies are and what my role is, to say what
09:15 13 does that mean in terms of power benefits? Does it improve
09:15 14 your system performance, system powered by 5 percent, 10
09:15 15 percent, whatever that number is, and so it's just trying to
09:15 16 quantify and putting numbers, some technical numbers to the
09:16 17 infringing technologies, and so I worked with Professor Conte
09:16 18 to provide this analysis.

09:16 19 Q. And do you have an understanding of what was done
09:16 20 with the results of your analysis?

09:16 21 A. My understanding is that the data that I provided to
09:16 22 Professor Conte was then sent or given to Dr. Sullivan, who you
09:16 23 will hear from a little bit later, which is then used to do
09:16 24 damage calculations.

09:16 25 Q. All right. Now, let's get to your specific analyses.

09:16 1 What specifically were the analyses you did in this case?

09:16 2 A. So I did two specific tasks that I'm listing in the
09:16 3 slide. The first one relates to the '373 patent, and here you
09:16 4 heard again from Professor Conte regarding these two power
09:16 5 supplies versus a single power supply connecting to the memory,
09:16 6 and my role here is to show you what is the power savings
09:17 7 associated with that ability to switch between the two power
09:17 8 supplies.

09:17 9 And then my second analysis is associated with the '759,
09:17 10 and in this particular patent, my role is to provide the power
09:17 11 used by the ring domain compared to the total chips. Because
09:17 12 the total chip has some power, what is the fraction of the
09:17 13 power that the ring is going to consume?

09:17 14 Q. And, Professor, at least on my screen, the -- like a
09:17 15 good teacher, you're making annotations on the slides. At
09:17 16 least on my screen those are not appearing just for your
09:17 17 information. They may not be on the jury's.

09:17 18 A. Okay.

09:17 19 Q. Now, was your approach in this case similar to your
09:17 20 universal research or was it different?

09:17 21 A. So the approach that I took to this task is similar
09:18 22 to the research that I conduct in my research group, in the
09:18 23 sense that we followed rigorous existing scientific methodology
09:18 24 to provide the power analysis.

09:18 25 But in addition, I also had the advantage of getting

09:18 1 access to Intel's confidential tools. And since I had access
09:18 2 to those confidential tools, I was able to conduct this
09:18 3 analysis more precisely because it's -- these tools are
09:18 4 designed and developed by Intel.

09:18 5 MR. WASHBURN: Now, and, Your Honor, we believe what's on
09:18 6 our slides and what he's planning to say is not confidential.
09:18 7 Intel can inform us if they disagree.

09:18 8 MR. MUELLER: Your Honor, I would ask if we could turn off
09:18 9 the monitors for the public. I'm not asking to seal the
09:18 10 courtroom --

09:18 11 THE COURT: Perfect.

09:18 12 MR. MUELLER: -- just turn off the monitors, please, Your
09:18 13 Honor.

09:18 14 THE COURT: But -- and Intel understands that this is
09:18 15 being broadcast by telephone, so I assume you're okay with that
09:19 16 as well?

09:19 17 MR. MUELLER: Yes, Your Honor. The only thing else I'd
09:19 18 ask is that if the witness is going to refer to specific
09:19 19 numbers in some of these spreadsheets, if he could instead just
09:19 20 refer to the screen in front of the jury without reading them.

09:19 21 THE COURT: That'd be fine.

09:19 22 Are you okay with that, sir?

09:19 23 MR. WASHBURN: We'd like to read exhibit numbers, but
09:19 24 aside from that, yes.

09:19 25 THE COURT: Oh, no. Sure. Of course. But -- you're

09:19 1 welcome to.

09:19 2 Doctor, do you understand?

09:19 3 THE WITNESS: Yeah. Thank you.

09:19 4 THE COURT: Very good. Thank you.

09:19 5 BY MR. WASHBURN:

09:19 6 Q. All right, sir. Then on the note of those
09:19 7 confidential tools, what specific tools did you use?

09:19 8 A. Yeah. So as I just mentioned, I used tools that were
09:19 9 provided to me by Intel. These are Intel's confidential tools
09:19 10 that I have used.

09:19 11 And in particular I used two of the Intel's confidential
09:19 12 tools for doing power modeling. One is called the Intel Power
09:19 13 Model. The other one is called the Fox2. So these are the two
09:19 14 tools that I used in this analysis.

09:19 15 Q. And how did you get access to these confidential
09:19 16 tools?

09:19 17 A. So since these are confidential tools, it's not
09:20 18 something that, even as a university professor, I would have
09:20 19 access to directly. It's not a website I can go and download
09:20 20 them from.

09:20 21 Instead, I would have to sign a protective order, and I
09:20 22 would have to go through some security protocols to log into
09:20 23 systems to get access. And there is a continuous video camera
09:20 24 on the computer that will monitor my access to these tools.

09:20 25 So every minute that I'm on the -- actually every second

09:20 1 I'm on the machine, there is a video that is continuously
09:20 2 streamed to Intel so they can see that I'm actually accessing
09:20 3 that tool.

09:20 4 Q. All right. Now, the first of the two tools that you
09:20 5 mentioned is the Intel Power Model tool. What is the Intel
09:20 6 Power Model tool?

09:20 7 A. So let me take a little bit of a deep dive into just
09:20 8 explaining what does that tool look like. This is a sort of a
09:20 9 screenshot of the Power Model tool. It might look a lot like a
09:21 10 spreadsheet that you may have seen before, like an Excel or
09:21 11 some other kind of spreadsheets, except this is fairly
09:21 12 complicated and it has thousands and thousands of inputs that
09:21 13 go into the model.

09:21 14 And these inputs are then used to compute the power
09:21 15 consumption of the chip. So we can say, when I put in these
09:21 16 inputs, the chip consumes less than 14 watts of power. And
09:21 17 again, watts are nothing but a unit of power, you probably
09:21 18 heard electric bulb is two watts, four watts. It's the same.
09:21 19 That's what power here stands for.

09:21 20 And this tool not only tells you the whole chip power, but
09:21 21 it can also divide the chip into multiple pieces and provide
09:21 22 the power consumption information for each of the pieces within
09:21 23 the chip. So it can kind of break down the power into multiple
09:21 24 components within the chip.

09:21 25 Q. And are you referring to Exhibit 77 there, sir?

09:22 1 A. Yes. It's hard to read, but my screen doesn't show
09:22 2 the exhibit number at the bottom, so...

09:22 3 Q. Have you seen any evidence of how much time Intel
09:22 4 spent building this Power Model tool?

09:22 5 A. So I reviewed Mr. Stephen Gunther's testimony, and he
09:22 6 has -- he was asked the same question regarding the effort
09:22 7 required to build these tools. And in his opinion, it takes
09:22 8 many thousands of hours to design and build these tools.

09:22 9 Q. And how does Intel use these Power Model tools?

09:22 10 A. So the way these tools are used is imagine that you
09:22 11 have a design and you want to make a change to the design. And
09:22 12 you want to make that one change, keeping everything else
09:22 13 constant.

09:22 14 So if you want to make that design change, you want to
09:22 15 know what is the impact of the change on the system's power.

09:23 16 So previously, if it was consuming 14 watts, if I made
09:23 17 this change, does it consume more than 14 watts or less than
09:23 18 14 watts? And I want to be able to make that analysis by doing
09:23 19 these comparisons. And these are the kinds of comparisons
09:23 20 Intel, I believe, does, which is also something -- again I
09:23 21 can't see the trial exhibit in here because it's hidden. So I
09:23 22 can just say that this is Intel's document that talks about
09:23 23 essentially this comparison analysis. We can use this for
09:23 24 doing, you know, what-ifs scenarios of a design.

09:23 25 Q. And, sir, are you referring to Slide 8.8, that has

09:23 1 the Exhibit No. 2477 on it?

09:23 2 A. Yeah. So I can see the slide number but not the --

09:23 3 Q. Thank you, sir.

09:23 4 A. -- the exhibit number, so...

09:23 5 Q. All right. The second of those two power testing
09:23 6 tools that you mentioned was the Fox2 tool. What is the Fox2
09:24 7 tool?

09:24 8 A. So Fox2 is another one of Intel's Power Model. And
09:24 9 the difference between this Power Model and the previously
09:24 10 described Power Model, the spreadsheet model, is that this
09:24 11 tool, the Fox2, can monitor the power consumption varying over
09:24 12 time. For example, if the CPU or the processor is running real
09:24 13 fast because it has to do a lot of work, it's going to burn
09:24 14 more power. So it's going to consume more power and that's
09:24 15 tracked at that instance in time.

09:24 16 And let's say a second later, the processor goes to some
09:24 17 idle state, like not much to do, sit there and go to sleep, in
09:24 18 which case its power goes down. And when the power goes up or
09:24 19 down, it's tracking these changes over time and continuously
09:24 20 figuring out what is the power consumption that chip is burning
09:24 21 as the workload goes up and down.

09:25 22 Q. And did you see any evidence of whether Intel finds
09:25 23 this tool reliable?

09:25 24 A. So again, I looked at a few documents that Intel has
09:25 25 provided me, which includes some e-mails where Intel engineers

09:25 1 talked about how good this tool is. "Tool" here Fox2. And
09:25 2 they talk about near 100 percent accurate correlation, which
09:25 3 means the data that this tool provides you is as close to the
09:25 4 actual physical chip that you are going to test on. So it's a
09:25 5 very good, accurate simulation of the tool -- of the chip.

09:25 6 Q. And are the two documents these referred to
09:25 7 Exhibits 2478 and 2465?

09:25 8 A. That's right. So you will see that this says
09:25 9 PTX-2478 and PTX-2465.

09:25 10 Q. So we've now talked about two tools you used for your
09:26 11 testing of power benefits of the patents. Did you have to
09:26 12 provide any inputs to those tools?

09:26 13 A. So there are two inputs that these tools take. The
09:26 14 first one is because Intel has literally, you know, dozens of
09:26 15 various kinds of processors, you have to first pick what
09:26 16 processor model that you want to actually measure this data on.
09:26 17 So one of the inputs is the processor model. And you've
09:26 18 probably heard by now words like "Haswell," "Broadwell." So
09:26 19 you have to first input one of that. That's the first input to
09:26 20 this system.

09:26 21 And the second input to the system, these tools, is what
09:26 22 kind of workload, does this -- this processor is likely to be
09:26 23 used. So is it doing computations or is it doing like Word
09:26 24 document reading? So we have to kind of give that input as
09:27 25 well.

09:27 1 So those are the two inputs that one has to give. One is
09:27 2 the CPU information, which you want to measure, and second is
09:27 3 the workload that you want to simulate on these systems.

09:27 4 Q. So starting with the first of those two inputs, how
09:27 5 did you decide which products to use as representative samples
09:27 6 in your analysis?

09:27 7 A. So when I started doing the analysis, I looked for
09:27 8 the processors which have the highest volume in terms of number
09:27 9 of units that are actually sold to pick that as the model that
09:27 10 I want to simulate in my system. And so I picked the
09:27 11 processors that are accused processors and also have the
09:27 12 highest volume. So that's how I picked what to simulate as the
09:27 13 processor.

09:27 14 Q. And then turning to the second of those two inputs
09:27 15 you described, how did you decide what work those products
09:28 16 would be doing in your tests?

09:28 17 A. So if you recall the second of the inputs, the first
09:28 18 one is the processor model; the second one is the workload, the
09:28 19 kind of work the system is expected to do. And here I relied
09:28 20 on a -- something called a "MobileMark." This is a benchmark
09:28 21 suite, and obviously it's not a very common term. So benchmark
09:28 22 is nothing but a collection of applications --

09:28 23 (Interruption.)

09:28 24 (Off-the-record discussion.)

09:28 25 THE COURT: No one else is allowed to have a phone, so...

09:28 1 If anyone else's goes off, you get a pass.

09:28 2 (Laughter.)

09:28 3 THE WITNESS: I didn't even bring my phone in just to be
09:28 4 safe.

09:28 5 BY MR. WASHBURN:

09:28 6 Q. So, sir, I think you were describing your use of
09:28 7 benchmarks in your analysis.

09:28 8 A. Correct. And so for the MobileMark, it's a
09:29 9 collection of applications, and I kind of listed a few here
09:29 10 that are quite familiar to many of you: Word documents, you
09:29 11 must have read, edited things like Word documents; Internet
09:29 12 Explorer, which is a browser you can browse the web with; Excel
09:29 13 spreadsheets; and PDF document readers. So these are things
09:29 14 that you would have used on a daily basis in using your
09:29 15 computers.

09:29 16 And so it's packaged, the collection of applications that
09:29 17 are packaged together, and that's what is called a MobileMark.

09:29 18 Q. Now, is MobileMark limited to laptops in terms of its
09:29 19 use in research like yours?

09:29 20 A. So there is a little bit of a misnomer here. It says
09:29 21 "MobileMark," kind of giving you an impression that it is a
09:29 22 mobile, which typically corresponds to things that can be
09:29 23 moved, like laptops.

09:29 24 But if you look at the applications that -- I've
09:29 25 highlighted a few of them, like the Word, Excel spreadsheets

09:30 1 and PDF readers -- these are not just on laptops. They're also
09:30 2 on your desktops and like, for example, the PowerPoint that we
09:30 3 are projecting on this particular screen is not just a
09:30 4 laptop-only projection, but it is on desktops and such.

09:30 5 So these are used across a broad spectrum of computing
09:30 6 systems, if you would like to think of it that way.

09:30 7 Q. Did you do any of your own testing to confirm the
09:30 8 data in Intel's Power Model?

09:30 9 A. So the Intel Power Model, as well as the Fox2,
09:30 10 require you to pick the work -- the application that the user
09:30 11 is going to look at or run, and they come with their own data
09:30 12 set for picking that workload.

09:30 13 What I did was I took six different computers, and I ran
09:31 14 the MobileMark on those six different computers. These are
09:31 15 some of the accused processors have -- these systems have them.
09:31 16 And when this MobileMark is running on these computer systems,
09:31 17 I measured how active the CPU is, how sleepy the CPU is at
09:31 18 various times as the workload continues to progress.

09:31 19 So just to give you an idea, the MobileMark, for example,
09:31 20 really simulates the end user behavior, like, for instance,
09:31 21 think of Word document. You are not editing every single
09:31 22 second. You edit a few words and then you're going to just
09:31 23 sort of stare at what you wrote so that you can go back and
09:31 24 edit again. And so it has this notion of idleness, where
09:31 25 you're actually just staring at the screen, and it can actually

09:31 1 simulate that behavior also.

09:31 2 And so as it simulates, it actually tells you what the CPU
09:32 3 usage looks like. Oh, now I'm actually active, now I'm not
09:32 4 active, now I'm active. So it's maintaining this information.
09:32 5 And so I measured that.

09:32 6 And once I measured that, I then chose that measured
09:32 7 values to see which of the Intel's various power available
09:32 8 system -- power models that are available have a reasonable
09:32 9 match, and I picked the one which has a close match to that.

09:32 10 Q. All right. Well, thank you for that discussion of
09:32 11 the two tools that you used.

09:32 12 I'd now actually like to turn back to the first of the two
09:32 13 analyses that you did with these tools. The first, I believe,
09:32 14 related to the '373 patent. Could you describe that analysis
09:32 15 for the jury?

09:32 16 A. Yeah. So just to recollect the -- this particular
09:32 17 slide. You've seen this multiple times, I believe, in
09:32 18 Professor Conte's presentation. So if you recall the '373
09:32 19 solution that Professor Conte described as having two power
09:33 20 supplies, which are shown in these two different colors, and
09:33 21 when my ring is sleeping here, the CBO and the ring is
09:33 22 sleeping, then basically the power comes from the top power
09:33 23 supply.

09:33 24 When the ring is not sleeping, so when the ring is
09:33 25 actually -- so this is showing you what ring is sleeping, but

09:33 1 let's say the ring is actually active, then the power comes
09:33 2 from this.

09:33 3 And so I simulated this and this mux which is nothing but
09:33 4 a selection between these two choices. And I simulated both of
09:33 5 them and said, okay, so this is how much power is going to be
09:33 6 consumed if I did this '373.

09:33 7 The alternative solution, if I didn't have this muxing
09:33 8 capability, is to have a single power supply which is what is
09:33 9 shown here, on the alternative strategy. So I simulated the
09:34 10 alternative strategy where the power is provided to the ring
09:34 11 and to the memory, the C6 SRAM.

09:34 12 And even if the ring is sleeping, we still have the power
09:34 13 going to the SRAM from this power supply, and therefore the
09:34 14 ring is also getting that power even if it is sleeping. So
09:34 15 it's kind of going to borrow a little bit of extra power simply
09:34 16 because the way these systems work, if you give them power even
09:34 17 if they are sleeping, they would burn some of it.

09:34 18 Q. So thank you for that conceptual explanation. And
09:34 19 could you just explain briefly -- or concretely what you
09:34 20 actually did?

09:34 21 A. Yeah. So let me take the slide down.

09:34 22 So the way to do this experiment, those two scenarios that
09:34 23 I described, is to take the power model, and within the Power
09:34 24 Model you create a scenario where whenever the ring sleeps, the
09:34 25 power to the C6 SRAM comes from the top power supply. Whenever

09:35 1 the ring is awake, the power to the C6 SRAM comes from the
09:35 2 bottom of the two power supplies. And so you do that
09:35 3 simulation.

09:35 4 And for the alternative strategy is simply ignore whether
09:35 5 this ring is sleeping or not, constantly provide the power to
09:35 6 the C6 SRAM and the ring always from the same power supply.
09:35 7 And so now you have these two choices that you can model within
09:35 8 that Intel Power Model.

09:35 9 Q. And what did you find in your '373 analysis, sir?

09:35 10 A. So I'm going to put some numbers to the benefit. So
09:35 11 basically this is a Haswell processor, which is one of the
09:35 12 accused processors, I believe. It is two cores is what I
09:35 13 simulated with 15-watt power consumption. And this is the
09:35 14 power consumption without the mux. So this is -- I didn't have
09:35 15 that solution where there is no selected. It burned 1761
09:36 16 milliwatts.

09:36 17 When I have the mux, basically I can reduce the power
09:36 18 consumption down by 96 milliwatts to 1665 milliwatts. And
09:36 19 therefore the total power savings, because of the selection
09:36 20 capability, is 5.45 percent which is just simply 96 divided by
09:36 21 the 1761.

09:36 22 Q. Was Haswell the only accused product for which you
09:36 23 did this analysis?

09:36 24 A. I did this analysis also for the second of the
09:36 25 accused products, for '373 which is the Broadwell processor.

09:36 1 And here the Broadwell processor, two cores again, same
09:36 2 analysis, 1353 milliwatts versus 1261 [sic] so you save
09:36 3 6.36 percent.

09:36 4 Q. All right. Thank you.

09:36 5 Let's turn now to the second of your two analyses, the one
09:36 6 related to the '759 patent.

09:36 7 Can you describe that for the jury?

09:36 8 A. Yeah. So for the '759 I'm interested in measuring
09:37 9 the power consumed by the ring bus domain as a fraction of the
09:37 10 total chip. And so that's the analysis that I am interested in
09:37 11 conducting.

09:37 12 Q. And how did you go about that analysis?

09:37 13 A. So let me again take down the slide just a minute
09:37 14 here to explain.

09:37 15 So for the '759 analysis, what I have done is I have taken
09:37 16 the Fox2, the model that I mentioned, the second of the two
09:37 17 power models.

09:37 18 And in this Fox2 I can essentially run a workload, and it
09:37 19 is measuring as the work is continuing. Let's say, for a
09:37 20 second, it will measure how the processor is going
09:37 21 active/inactive, active/inactive and all of that. And it will
09:37 22 basically divide the total power available of the chip and say
09:37 23 this is the power consumed by the ring domain, this is the
09:37 24 power consumed by the cores or the processors themselves.

09:38 25 So you can do this on Fox2 and you run it for whatever

09:38 1 number of minutes or seconds that you're interested in, and you
09:38 2 get the data back.

09:38 3 Q. And what results did you find?

09:38 4 A. So the results -- let me again put some numbers here.
09:38 5 So this is on a Whiskey Lake which is, I believe, one of the
09:38 6 accused products. It's a two-core Whiskey Lake that I used.
09:38 7 The ring domain consumes 1021 milliwatts from the Fox2 analysis
09:38 8 out of the total chip power of 5412. And so it is 1000 divided
09:38 9 by 5400 will give you 18.86 percent.

09:38 10 Q. Did you take any steps to confirm that number?

09:38 11 A. So I have also run this -- remember, this is done
09:38 12 with Fox2. I also have the ability to run this with the Power
09:38 13 Model, so I also did something similar with the Power Model
09:38 14 analysis, but not on Whiskey Lake but on other products.
09:39 15 There, the ring domain consumed between 17 to 24 percent. So
09:39 16 it's in the same ballpark here.

09:39 17 Q. And did you perform this exercise for any accused
09:39 18 products other than Whiskey Lake?

09:39 19 A. So let me go to my next slide, and I show you -- this
09:39 20 is for Skylake which is the second of the accused products.
09:39 21 And here is the power.

09:39 22 MR. MUELLER: I apologize for interrupting, Your Honor.
09:39 23 If we could just indicate the numbers rather than reading them
09:39 24 out loud for this section.

09:39 25 THE COURT: That would be fine.

09:39 1 MR. WASHBURN: No objection, Your Honor.

09:39 2 MR. MUELLER: Thank you, Your Honor.

09:39 3 BY THE WITNESS:

09:39 4 A. So here is the ring bus domain power, and here is the
09:39 5 total power. And you just divide this power by the total, you
09:39 6 get the ring bus domain power.

09:39 7 BY MR. WASHBURN:

09:39 8 Q. Thank you, sir.

09:39 9 To wrap up, after you completed your assignment, did you
09:40 10 report your findings to Professor Conte?

09:40 11 A. Yes. So after I finished my analysis, I provided
09:40 12 these results to Professor Conte who has explained some of that
09:40 13 and how he has used it in his own work.

09:40 14 So to -- basically to summarize the results that I
09:40 15 provided to Professor Conte, the memory power savings features
09:40 16 saves at least, you know, the number of power that -- since I'm
09:40 17 not supposed to speak the number, I will just highlight the
09:40 18 numbers. And the ring domain consumes at least the number that
09:40 19 is shown here.

09:40 20 Q. Are your results relevant to other accused products?

09:40 21 THE COURT: Counsel, you might want to, if you didn't,
09:40 22 make sure he references exactly for the record, on appeal,
09:40 23 which slides he's on since he's not giving the numbers. You
09:40 24 might want to do something to tether this part of his testimony
09:40 25 so when -- if anyone's looking at this, they know exactly which

09:41 1 slides.

09:41 2 MR. WASHBURN: Your Honor, I appreciate it.

09:41 3 BY MR. WASHBURN:

09:41 4 Q. Sir, were you referring to Slide 23 just now?

09:41 5 A. Yes. I was referring when I mentioned the numbers
09:41 6 that I cannot say loud, they are listed on PDX-8.23.

09:41 7 Q. And are your results relevant to other accused
09:41 8 products?

09:41 9 A. So I have shown the results for the two core
09:41 10 products, but these are also applicable to systems that have
09:41 11 different -- potentially different number of cores.

09:41 12 Q. Are you confident the results that you got accurately
09:41 13 measure the relevant power considerations?

09:41 14 A. I don't have any reason to doubt it. These are
09:41 15 fairly well-established robust tools.

09:41 16 Q. And why do you say that your results would be
09:41 17 relevant to products with different numbers of cores?

09:41 18 A. So the basic underlying technology is this mux, the
09:42 19 selection process that will switch between -- if I am looking
09:42 20 at '373, just focusing on that.

09:42 21 And there, it doesn't matter whether I have four of those
09:42 22 processors or two of those processors. It's just simply the
09:42 23 ability to switch. And, therefore, it's not as relevant to my
09:42 24 analysis to focus on four or eight, so I picked two.

09:42 25 Q. Now, could Intel have run a power analysis like yours

09:42 1 if it believed your results were incorrect?

09:42 2 A. So these are Intel's tools. So I would imagine it is
09:42 3 possible for Intel to run the same analysis that I have
09:42 4 conducted.

09:42 5 Q. Did Intel run a power analysis like yours?

09:42 6 A. To my understanding, they have not provided it --
09:42 7 that analysis from their end.

09:42 8 Q. Thank you, Professor Annavaram.

09:42 9 MR. WASHBURN: No further questions.

09:42 10 THE COURT: Counsel?

09:42 11 MR. MUELLER: Thank you, Your Honor.

09:42 12 CROSS-EXAMINATION

09:42 13 BY MR. MUELLER:

09:43 14 Q. Good morning, sir. My name is Joe Mueller and I'd
09:44 15 like to ask you a few questions if I could.

09:44 16 A. Please.

09:44 17 Q. Sir, you are testifying here today on behalf of VLSI,
09:44 18 correct?

09:44 19 A. That's my understanding.

09:44 20 Q. Now, the first time that you had heard of VLSI was
09:44 21 this case, right?

09:44 22 A. That's correct.

09:44 23 Q. Now, you understand there's two folks that work at
09:44 24 VLSI, and I want to ask you about each of them. Okay?

09:44 25 A. Okay.

09:44 1 Q. The first person I want to ask you about is Cindy
09:44 2 Simpson, the chief technology officer. You've heard of her,
09:44 3 correct?

09:44 4 A. I have not.

09:44 5 Q. You've not spoken with her?

09:44 6 A. No.

09:44 7 Q. The second person is Michael Stolarski, the CEO, who
09:44 8 was sitting in that chair right there on Monday. Do you know
09:44 9 him?

09:44 10 A. Not before this case, no.

09:44 11 Q. And as of last September you were not familiar with
09:44 12 VLSI's business, correct?

09:44 13 A. That's correct.

09:44 14 Q. Now, the jury heard earlier this week from Mr. Spehar
09:45 15 from NXP. Did you review that testimony?

09:45 16 A. Only briefly, yes.

09:45 17 Q. You have not spoken with Mr. Spehar, right?

09:45 18 A. I have not spoken to him, no.

09:45 19 Q. The jury also heard from Mr. Bearden from NXP. You
09:45 20 reviewed his testimony?

09:45 21 A. I watched parts of those, yes.

09:45 22 Q. And, sir, you have not spoken with Mr. Bearden,
09:45 23 correct?

09:45 24 A. I have not.

09:45 25 Q. Now, you are not offering any opinion in this case

09:45 1 that Intel infringes the '373 patent or the '759 patent,
09:45 2 correct?

09:45 3 A. That's correct. My analysis is not associated with
09:45 4 the infringement part of it.

09:45 5 Q. And you are not offering an opinion to the jury on
09:45 6 the issue of the validity of the '759 patent, right?

09:46 7 A. I am not offering whether the patent is valid or not,
09:46 8 correct.

09:46 9 Q. What you're here to talk about are your opinions on
09:46 10 certain power testing issues, correct?

09:46 11 A. That is my understanding, as I described.

09:46 12 Q. Now, you've been retained as an expert by VLSI,
09:46 13 right?

09:46 14 A. That's my understanding.

09:46 15 Q. And, sir, they have paid you in connection with your
09:46 16 work against Intel hundreds of thousands of dollars, correct?

09:46 17 A. That's correct.

09:46 18 Q. And that's part of the normal process for an expert
09:46 19 witness like you to be compensated for your time?

09:46 20 A. That would be correct.

09:46 21 Q. And you, in fact, have been compensated for your time
09:46 22 in this case, correct?

09:46 23 A. I have been compensated, correct.

09:46 24 Q. Now, sir, you've been working in the field of
09:46 25 computer architecture for decades, right?

09:46 1 A. Yes. I have been -- from '96 or so I have been in
09:46 2 the field. 1996.

09:46 3 Q. And, sir, you've you published many papers?

09:46 4 A. Easily, 100-plus papers.

09:47 5 Q. You've taught courses for quite some time?

09:47 6 A. I have been at USC for about 13 years, so I taught
09:47 7 during that time many courses.

09:47 8 Q. And you of course have tried to stay current and
09:47 9 up-to-date on significant developments in the field of computer
09:47 10 architecture, right?

09:47 11 A. That's a fair statement, correct.

09:47 12 Q. It's an important part of your job as a professor,
09:47 13 correct?

09:47 14 A. Yes. So we usually read the latest developments as
09:47 15 part of our research progress.

09:47 16 Q. And yet, sir, you'd never heard of the '373 patent
09:47 17 before this case?

09:47 18 A. No. I haven't heard of '373 before.

09:47 19 Q. Nor, sir, had you heard of the '759 patent before
09:47 20 this case?

09:47 21 A. No. I have not heard of '759.

09:47 22 Q. Now, I want to show you in an article that was shown
09:47 23 to the jury earlier this week -- actually a demonstrative that
09:48 24 has an excerpt of an article.

09:48 25 MR. MUELLER: If we could pull up PDX-13.2, please.

09:48 1 BY MR. MUELLER:

09:48 2 Q. And I believe you testified, but I want to make sure
09:48 3 I have this right, that you at least reviewed a portion of
09:48 4 Mr. Spehar's testimony; is that right, sir?

09:48 5 A. Just briefly, correct.

09:48 6 Q. Okay. Let me just show you what was shown to the
09:48 7 jury right here. This is an article that Mr. Spehar authored.
09:48 8 And do you see, sir, it says "Power Challenges Caused By IOT
09:48 9 Edge Nodes Securing and Sensing Our World"? Do you see that?

09:48 10 A. I see that.

09:48 11 Q. And the first paragraph, the highlighting that was
09:48 12 actually in the version that was shown to jury, I'm not going
09:48 13 to read all of it. I really just want to just focus your
09:48 14 attention, if I could, sir, on the very next sentence.

09:48 15 Do you see it says: There exists many approaches to
09:48 16 reduce power. Do you see that, sir?

09:48 17 A. That's correct.

09:48 18 Q. And that's a true statement?

09:48 19 A. Yeah. I think there are many ways to reduce power
09:48 20 consumption in computer systems.

09:48 21 Q. And, in fact, there is an almost infinite number of
09:49 22 ways to do it, correct?

09:49 23 A. And infinite may be too much, but yes, there are many
09:49 24 methods to reduce power consumption, and some of the work that
09:49 25 we do in my lab is an example of that.

09:49 1 Q. You've done work yourself over the years on ways to
09:49 2 increase power consumption, correct?

09:49 3 A. Decrease power consumption.

09:49 4 Q. I'm sorry. Decrease power -- I misspoke. Decrease
09:49 5 power consumption.

09:49 6 A. That is correct.

09:49 7 Q. And other folks have too?

09:49 8 A. Yeah, there is an active research group in the
09:49 9 country and around the world where people look at computer
09:49 10 powers as -- their action techniques and how to reduce the
09:49 11 power consumption of computer systems.

09:49 12 Q. And certainly no one has a patent on all of the
09:49 13 different ways to save power, correct?

09:49 14 A. I wouldn't know one way or the other. I have not
09:49 15 analyzed that.

09:49 16 Q. You're not aware of a single patent that covers every
09:49 17 possible way of saving power?

09:49 18 A. I think it's infeasible in my opinion.

09:50 19 Q. Infeasible?

09:50 20 A. Everything in the world, no.

09:50 21 Q. Okay. Now, sir, you did some testing in this case to
09:50 22 measure various types of power use and consumption, correct?

09:50 23 A. Yeah. So I -- as I explained in my direct, I have
09:50 24 done some analysis.

09:50 25 Q. And I'd like to ask you, if I could, sir, about a

09:50 1 hypothetical to try to get at the methodology that might be
09:50 2 used in a case like this. Okay?

09:50 3 A. Sure.

09:50 4 Q. So I'm going to pose a hypothetical, and if any part
09:50 5 of it is unclear, please just tell me and I'll try to clarify.

09:50 6 A. Understood.

09:50 7 Q. All right. So let's assume that the Ford Motor
09:50 8 Company comes up with an invention for saving fuel consumption
09:50 9 when a gas-powered vehicle is in fifth gear. Are you with me
09:50 10 so far?

09:50 11 A. I'm not a big car guy, but I understand.

09:50 12 Q. Understood. I'll try to -- again, if I'm unclear at
09:50 13 any point, just let me know and I'll try to rephrase.

09:50 14 A. Sure.

09:50 15 Q. But the idea is Ford comes up with a way to save
09:51 16 gasoline use when a gas-powered vehicle is in fifth gear.
09:51 17 You're with me so far?

09:51 18 A. Yes. I believe I am.

09:51 19 Q. Okay. And Ford decides to use this across its entire
09:51 20 fleet of gas-powered vehicles. Still with me?

09:51 21 A. Understood.

09:51 22 Q. And, again, this is only for fifth gear. All right?

09:51 23 A. Okay.

09:51 24 Q. And let's assume other companies don't have this
09:51 25 invention. Chevrolet, Toyota, Honda do not have this same

09:51 1 invention. Still with me?

09:51 2 A. Yeah, I am.

09:51 3 Q. Now, you would agree with me that Ford has many
09:51 4 different types of vehicles, right?

09:51 5 A. Yeah. I mean, I'm not a big car person so I don't
09:51 6 know all the models, but I assume they have dozens of models.

09:51 7 Q. So in my hypothetical, if Ford wanted to figure out
09:51 8 how this much this invention saves gas use across its entire
09:51 9 fleet, it would need to look across its entire fleet, correct?

09:51 10 A. I'm not sure how gas-powered car analysis is done,
09:52 11 but I guess so. I'm not sure.

09:52 12 Q. It would make sense.

09:52 13 A. It's -- I guess depends on how the systems are --
09:52 14 engines are designed. If there is some aspect of the fifth
09:52 15 gear is similar to multiple cars, you can do on one car and
09:52 16 apply it. So it's -- again, I'm not an automotive person to
09:52 17 know that detail.

09:52 18 Q. Let me ask you this. You wouldn't test a Chevy
09:52 19 vehicle to determine how much savings could come from the Ford
09:52 20 invention, correct?

09:52 21 A. Yeah, as long as their technologies are different, I
09:52 22 think that is possible.

09:52 23 Q. And you wouldn't test a vehicle's gas use in first
09:52 24 gear because this is a fifth-gear invention, correct?

09:52 25 A. Yeah. So, I mean, some of the analogy is lost on me

09:53 1 simply because I don't have a multigear car and so it's hard to
09:53 2 understand, but I think I understood that if it is applied to
09:53 3 first gear, maybe.

09:53 4 Q. It wouldn't make sense to test it in first gear if
09:53 5 it's a fifth-gear invention, correct?

09:53 6 A. Possibly. Again, I wouldn't know.

09:53 7 Q. So let's talk about your testing.

09:53 8 Now, just so we're clear here, what VLSI is saying
09:53 9 infringes the '373 patent are two families of Intel processors,
09:53 10 the Broadwell processors and the Haswell processors, correct?

09:53 11 A. That's my understanding, that those are the two
09:53 12 accused products.

09:53 13 Q. Now, for the other patent in the case, the '759
09:53 14 patent, those families of processors, Broadwell and Haswell,
09:53 15 are not accused, correct?

09:53 16 A. That's my understanding.

09:53 17 Q. For the '759 patent it's different families of Intel
09:54 18 processors. They're called the Lake series because they're
09:54 19 named after lakes, right?

09:54 20 A. Yeah, that's what I heard from Professor Conte's
09:54 21 deposition presentation yesterday.

09:54 22 Q. And so for the '373 patent, you did an analysis of
09:54 23 Broadwell and Haswell, correct?

09:54 24 A. I provided results for both Broadwell and Haswell for
09:54 25 the '373.

09:54 1 Q. And for the '759 patent, you analyzed these Lake
09:54 2 series processors, right?

09:54 3 A. That's correct.

09:54 4 Q. Now, let's be clear. You didn't actually hook up any
09:54 5 of these chips to equipment to measure the electricity in them,
09:54 6 right?

09:54 7 A. Yeah. As I mentioned, these were done through the
09:54 8 power models, not connecting the chip to some power monitoring
09:54 9 infrastructure.

09:54 10 Q. You took these two Intel tools, the Power Model and
09:54 11 Fox2, and used those to compute your estimates, right?

09:54 12 A. I used them to compute the numbers I provided you.
09:55 13 Correct.

09:55 14 Q. So let's go to PDX-8.14, and I want to start, if I
09:55 15 could, sir, with your analysis of the products accused for the
09:55 16 '373 patent. Do you have those in mind?

09:55 17 A. Yeah.

09:55 18 Q. Okay. So let's go to PDX-8.14. This was the slide
09:55 19 you showed the ladies and gentlemen of the jury, right?

09:55 20 A. That's correct.

09:55 21 Q. Now, on the left-hand side here you have "373
09:55 22 solution." Do you see that, sir?

09:55 23 A. Yes.

09:55 24 Q. And then below that you have the C6 SRAM. Do you see
09:55 25 that, sir?

09:55 1 A. Yeah.

09:55 2 Q. Now, let's be clear. The C6 SRAM that you're putting
09:55 3 here, that's not actually in the '373 patent. That's what's
09:55 4 accused?

09:55 5 A. That's my understanding, as in I didn't do any
09:55 6 infringement analysis.

09:55 7 Q. Right. But this portion of your diagram right here
09:55 8 underneath the heading "'373 Solution," that's not actually in
09:55 9 the patent, correct?

09:55 10 A. The C6 SRAM as a word I don't think appears.

09:56 11 Q. Now, this is the portion of your analysis where you
09:56 12 use the Intel Power Model, right?

09:56 13 A. Yeah.

09:56 14 Q. It's a large spreadsheet with lots of complex
09:56 15 formulas in it?

09:56 16 A. That's a fair statement.

09:56 17 Q. It involves hundreds of thousands of inputs?

09:56 18 A. Yeah, it has lots and lots of inputs, takes a long
09:56 19 time to run these actually on a computer system.

09:56 20 Q. And this is a spreadsheet that was created by Intel
09:56 21 engineers?

09:56 22 A. Yes. Absolutely.

09:56 23 Q. Now, you did not do a test of each of the Haswell and
09:56 24 Broadwell processors using this Power Model, correct?

09:56 25 A. I did the two systems that I mentioned, the two-core

09:56 1 Haswell and two-core Broadwell, 15-watt products.

09:56 2 Q. The Broadwell and Haswell processors are each a
09:57 3 family of processors, right?

09:57 4 A. Yeah, as I explained to the jury, gentlemen and
09:57 5 ladies, that there are different variations but the underlying
09:57 6 core technology, that's correct.

09:57 7 Q. There's 350 different versions, correct?

09:57 8 A. I don't recall the exact number. Yes.

09:57 9 Q. You do remember there's hundreds of versions of these
09:57 10 processors?

09:57 11 A. That's possible. That's very possible.

09:57 12 Q. And of those you tested two, correct?

09:57 13 A. So I tested the two-core 15-watt products, correct.

09:57 14 Q. And what you did to test -- your testing involved the
09:57 15 use of some laptops to figure out workload, correct?

09:57 16 A. So I used the laptop data to figure out which Power
09:57 17 Model data to use. Correct.

09:57 18 Q. So let's try to make sure we're on the same page
09:57 19 here. What you did is you used some laptops to figure out what
09:57 20 inputs to put into the Power Model. Do I have that right?

09:57 21 A. I would revisit as to what inputs to select from the
09:58 22 Power Model.

09:58 23 Q. Fair enough. Select from the Power Model.

09:58 24 A. Correct.

09:58 25 Q. Let's take a look at PDX-8.12. And you used the

09:58 1 MobileMark program in conjunction with six different actual
09:58 2 computers, correct?

09:58 3 A. That's correct.

09:58 4 Q. And this was to help you figure out which inputs to
09:58 5 select in the Power Model?

09:58 6 A. That's a fair statement. Yes.

09:58 7 Q. We can take this down.

09:58 8 Now, of the six computers that you used, it turned out
09:58 9 four of them did not actually have accused chips within them,
09:58 10 correct?

09:58 11 A. They were Ice Lake and other Lake products in them.

09:58 12 Q. Well, let's take a look, if we could, at your report
09:58 13 if you want to refresh your memory, and there should be a Tab 1
09:58 14 in your binder, and I'd like you to take a look at, sir, if you
09:59 15 wouldn't mind, Paragraph 49.

09:59 16 MR. MUELLER: And I won't show it to the jury, Your Honor.
09:59 17 I'll let him review it first.

09:59 18 THE COURT: Sure.

09:59 19 BY MR. MUELLER:

09:59 20 Q. And, sir, just let me know when you're there.

09:59 21 A. Yeah, I am on -- I am on my report, yes.

09:59 22 Q. So Paragraph 49 lists the six computers you tested,
09:59 23 correct?

09:59 24 A. That is correct.

09:59 25 Q. And the last four on the list use Lake processors

09:59 1 which are not accused of infringing the '373 patent, correct?

09:59 2 A. That is correct.

09:59 3 Q. So for your '373 testing, you used products that were
09:59 4 not actually accused of infringing the '373 patent, right?

09:59 5 A. The -- the residency numbers across all the six were
09:59 6 quite close.

10:00 7 Q. Sir, the Lake processors are not accused of
10:00 8 infringing the '373 patent.

10:00 9 A. That's correct.

10:00 10 Q. Now, there's more than 300 different Haswell
10:00 11 processors, right?

10:00 12 A. I don't remember the exact SKU numbers available, but
10:00 13 I would take your word for it.

10:00 14 Q. And that is a family accused of infringing the '373?

10:00 15 A. That would be correct.

10:00 16 Q. But you didn't use any computers at all that
10:00 17 contained a Haswell processor; isn't that true?

10:00 18 A. I used the Broadwell but not the Haswell, correct.

10:00 19 Q. Now, you understand that what's being accused for the
10:00 20 '373 in particular is this component called the C6 SRAM, right?

10:00 21 A. That's my understanding. Correct.

10:00 22 Q. It's one of the thousands of components within these
10:00 23 chips, correct?

10:00 24 A. Yeah, certainly there are many components in these
10:00 25 chips.

10:00 1 Q. And you had to figure out what the power usage was
10:00 2 associated with that C6 SRAM, fair?

10:01 3 A. That's one of the things that I had to do.

10:01 4 Q. Now, sir, if you go to Paragraph 59 of your report,
10:01 5 and I may ask you to refer to it, but if you just take a look
10:01 6 at it, let me know when you're there.

10:01 7 A. Yes. I am.

10:01 8 Q. Now, sir, in this section of your report, it was
10:01 9 showing data that you generated from testing those six
10:01 10 computers, right?

10:01 11 A. Yeah. This is the spreadsheet of the data of the
10:01 12 residencies.

10:01 13 Q. And, again, you were trying to figure out the
10:01 14 workload associated with actually using the C6 SRAM?

10:01 15 A. I was trying to figure out which of the various power
10:01 16 models I should select based on the residency data.

10:01 17 Q. To approximate use of the C6 SRAM?

10:02 18 A. Yeah. To find a close -- reasonably close match.

10:02 19 Q. Now, the first column -- and if we could pull this
10:02 20 figure up here just to make sure we're all on the same page.

10:02 21 The first column identifies what's called the C-state
10:02 22 residency.

10:02 23 MR. MUELLER: And, Your Honor, if we could turn off the
10:02 24 public monitors for this --

10:02 25 THE COURT: Okay.

10:02 1 MR. MUELLER: -- but we don't have to seal the courtroom.

10:02 2 BY MR. MUELLER:

10:02 3 Q. Sir, the first column here identifies the C-state
10:02 4 residency that you're measuring, right?

10:02 5 A. It's measuring the C0 residency. Correct.

10:02 6 Q. And the other six columns represented each of the six
10:02 7 computers you tested, right?

10:02 8 A. The -- these six columns represent the six computers
10:02 9 that I measured. Correct.

10:02 10 Q. Now, if we look down to the middle of this table, do
10:02 11 you see you put in bold a row that says system Core C7? Do you
10:02 12 see that, sir?

10:03 13 A. Yeah. It says C7 residency. Correct.

10:03 14 Q. The values in the Core C7 state row are listed right
10:03 15 there, right?

10:03 16 A. Yes.

10:03 17 Q. And let's be really clear with the ladies and
10:03 18 gentlemen of the jury, this is Core C7, right?

10:03 19 A. So this is the Core C7.

10:03 20 Q. And that's what you put in bold, correct?

10:03 21 A. That's correct.

10:03 22 Q. But, sir, the truth is C6 SRAM is not actually used
10:03 23 in Core C7, is it?

10:03 24 A. It's used in the package when the package was sent to
10:03 25 the --

10:03 1 Q. It's used in the package C7, right?

10:03 2 A. It's used in the package. Correct. Package state.

10:03 3 Q. It's not used in the core state?

10:03 4 A. If only a single core is sleeping, no.

10:03 5 Q. I'm sorry, sir?

10:03 6 A. If there's only a single core that is sleeping, it
10:03 7 doesn't.

10:03 8 Q. So when you bolded the Core C7, that was not right?

10:04 9 A. But as I mentioned, this is just to get an
10:04 10 approximate match to the actual Intel data. Correct.

10:04 11 Q. If you'd just stay with my question: When you bolded
10:04 12 Core C7, that was not a correct indication of when C6 SRAM is
10:04 13 used, right?

10:04 14 A. I guess you could say that, if you -- if that makes
10:04 15 it easier.

10:04 16 Q. Now, you took the data from your six laptops, and you
10:04 17 used that to select the inputs back in the Power Model, right?

10:04 18 A. Yeah. So I actually only used this data to find the
10:04 19 closest one, but I didn't use this data to actually do my
10:04 20 computations.

10:04 21 Q. Now, again there were two of these six laptops that
10:04 22 had actual accused processor in them, right?

10:04 23 A. Correct.

10:04 24 Q. Then you went back --

10:04 25 A. For the '373 patent.

10:04 1 Q. For the '373. Yep.

10:04 2 A. Just to be clear. Yes.

10:04 3 Q. Thank you.

10:04 4 Then when you went back to the Power Model, that had a
10:04 5 long list of SKU, which is the model number for the various
10:05 6 products, correct?

10:05 7 A. That's correct.

10:05 8 Q. But when you went back to the Power Model, you did
10:05 9 not use the same two SKUs that you had used in the laptops, did
10:05 10 you?

10:05 11 A. As I explained, I picked the processors which are the
10:05 12 most volume-wise sold products. Correct.

10:05 13 Q. Sir, if you'd please just stay with my question.

10:05 14 You didn't use the same processors for the Power Model as
10:05 15 you used for the laptops, did you?

10:05 16 A. They are the same family, but not the exact -- I
10:05 17 don't remember the exact SKU number. I don't think so.

10:05 18 Q. They were not?

10:05 19 A. I don't recall that number, the precise SKU numbers.

10:05 20 Q. Let's go over to the '759 patent. Do you have that
10:05 21 in mind?

10:05 22 A. Sure.

10:05 23 Q. And this patent, what's being accused are these Lake
10:05 24 series processors, correct?

10:05 25 A. That's my understanding.

10:05 1 Q. Now, here you use something called Fox2, right?

10:06 2 A. That's the tool I used for analysis.

10:06 3 Q. And this is a tool that was developed by Intel
10:06 4 engineers?

10:06 5 A. That's my understanding. Correct.

10:06 6 Q. And you applied this tool to some Broadwell processor
10:06 7 technology, correct?

10:06 8 A. Say that again? I don't think I'm on the same page
10:06 9 with you on that.

10:06 10 Q. Sure. Let me try to clarify. You adjusted the Fox2
10:06 11 tool for your work in analyzing the '759 patent issues, right?

10:06 12 A. I selected the processor model for Fox2. Correct.

10:06 13 Q. And you adjusted it based on tests that you ran on a
10:06 14 Broadwell processor, correct?

10:06 15 A. On the collection across various systems. I don't
10:06 16 remember if it was just the Broadwell.

10:06 17 Q. Let me try to refresh your memory. If you could look
10:06 18 at your report, sir, at Paragraph 137, and take your time, and
10:06 19 let me know when you're there.

10:06 20 A. Okay. Thank you. Yes.

10:07 21 Q. And do you see, sir, in Paragraph 137, you
10:07 22 specifically stated that you had run tests on a Broadwell CPU
10:07 23 as a test system?

10:07 24 A. That's correct.

10:07 25 Q. So you adjusted the Fox2 tool using this Broadwell

10:07 1 test?

10:07 2 A. That's correct. Yes.

10:07 3 Q. But, sir, the Broadwell processors are not accused of
10:07 4 infringing the '759 patent, are they?

10:07 5 A. Yeah. Yeah.

10:07 6 Q. Yes, they are not?

10:08 7 A. Yes. They are not. Yes.

10:08 8 Q. Now, there's ten processor families accused of
10:08 9 infringing the '759 patent, correct?

10:08 10 A. I believe that's correct. I'm not exactly sure the
10:08 11 numbers there.

10:08 12 Q. You had access to the Fox2 tool for multiple Lake
10:08 13 series processors, correct?

10:08 14 A. Could you please repeat the question, please?

10:08 15 Q. Sure. You had access to this Fox2 tool for multiple
10:08 16 Lake series processors, right?

10:08 17 A. I believe I had only access to two of them. The
10:08 18 Skylake and the Whiskey Lake, which is what I used in my
10:08 19 analysis.

10:08 20 Q. Well, let's take a look at your report at
10:08 21 Paragraph 64, and if you could let me know when you're there.

10:09 22 Are you there, sir?

10:09 23 Do you see in the last sentence it says -- you said,
10:09 24 "Intel has produced nearly identical versions of Fox2 for
10:09 25 Whiskey Lake, Coffee Lake, Kaby Lake and Skylake."

10:09 1 Do you see that, sir?

10:09 2 A. That's correct.

10:09 3 Q. And so you had access to those, right?

10:09 4 A. Yeah. That's what I was saying, that I didn't have
10:09 5 access to all the ten different versions, but the few versions
10:09 6 that are identical.

10:09 7 Q. But you did not use the version that you had access
10:09 8 to for Coffee Lake, correct?

10:09 9 A. Yeah. I used two of those four. Correct.

10:09 10 Q. You did not use it for Coffee Lake, did you?

10:09 11 A. I did not use it for Coffee Lake. Correct.

10:09 12 Q. And you did not use it for Kaby Lake, correct?

10:09 13 A. Yeah. I used other two. Correct. That's correct.

10:09 14 Q. So you used two and you said that was enough for all
10:09 15 ten accused Lake series families, correct?

10:09 16 A. That's correct. Yes.

10:09 17 Q. Now, for this '759 patent analysis, Dr. Conte, who we
10:10 18 heard from yesterday, asked you to calculate the portion of
10:10 19 processor power consumed by the ring interconnect relative to
10:10 20 some other components in Intel's processors. Do I have that
10:10 21 right, sir?

10:10 22 A. I believe the exact --

10:10 23 Q. And if it helps, sir, Paragraph 122 in your report.

10:10 24 A. Yeah.

10:10 25 Q. Take your time. And do you see, sir, in that second

10:10 1 sentence, it says, "I have been asked by Professor Conte to
10:10 2 calculate the percentage of power used by the ring interconnect
10:10 3 relative to other components involved in Speed Shift's
10:11 4 operation"? Do you see that, sir?

10:11 5 A. That's correct.

10:11 6 Q. And that is what Mr. Conte -- or Dr. Conte asked you
10:11 7 to do?

10:11 8 A. That's correct.

10:11 9 Q. Now, your Fox2 test calculated the power usage of
10:11 10 something called the "CLR domain," right?

10:11 11 A. There's the ring domain. Yes. That's correct.

10:11 12 Q. And that contains multiple components, correct?

10:11 13 A. That's my understanding. Correct.

10:11 14 Q. You calculated a single power usage value for all the
10:11 15 components within that CLR domain, right?

10:11 16 A. So I computed the fraction of the power consumed by
10:11 17 the ring bus domain, which I think you're calling a CLR domain.

10:11 18 Q. Right. And the CLR domain includes the ring itself,
10:11 19 correct?

10:11 20 A. It has the ring. Yes.

10:11 21 Q. It also includes something called the C-B-O, right?

10:11 22 A. The CBO. Yeah. That's correct.

10:11 23 Q. And the LLC, correct?

10:11 24 A. That's my understanding. Correct.

10:11 25 Q. Now, you did not isolate the ring from those other

10:12 1 components I just named, did you?

10:12 2 A. I measured the power consumption of the whole domain.

10:12 3 Correct. Not the individual pieces inside.

10:12 4 Q. Not individually the ring, correct?

10:12 5 A. Not individually the ring.

10:12 6 Q. Just a few final questions, sir.

10:12 7 All the work you did in this case was with respect to

10:12 8 Intel products, correct?

10:12 9 A. That's correct.

10:12 10 Q. Using some Intel tools, right?

10:12 11 A. These are Intel tools. Exactly.

10:12 12 Q. Developed by Intel engineers?

10:12 13 A. Absolutely.

10:12 14 Q. You did not do any power testing analysis to show the
10:12 15 benefits of the '373 patent using NXP products, correct?

10:12 16 A. No. I did not use NXP tools.

10:12 17 Q. Nor Freescale products?

10:12 18 A. No.

10:12 19 Q. Nor SigmaTel products?

10:12 20 A. I did not use SigmaTel.

10:12 21 Q. Nor did you do any testing of the '759 patent alleged
10:12 22 benefits with respect to NXP products?

10:12 23 A. I did not do NXP products. Correct.

10:13 24 Q. Freescale products?

10:13 25 A. No. I didn't.

10:13 1 Q. SigmaTel products?

10:13 2 A. I did not do SigmaTel products.

10:13 3 Q. And in the testimony of this trial that you've
10:13 4 reviewed, no such product has been identified, correct?

10:13 5 A. That's -- I mean, I only listened to parts of the
10:13 6 things, so I don't know exactly. Yeah.

10:13 7 Q. You're not aware of a single Freescale, SigmaTel, NXP
10:13 8 product that uses either the '373 or the '759 patent, correct?

10:13 9 A. I would imagine -- I mean, I'm not sure of all the
10:13 10 details, but that's what -- if you tell me, I'll take that word
10:13 11 for you.

10:13 12 Q. You're not here to identify any such product
10:13 13 yourself, are you?

10:13 14 A. I am not identifying that product.

10:13 15 Q. Okay. Last couple of questions.

10:13 16 You understand Intel's position is that the products you
10:13 17 tested don't infringe either the '373 or the '759 patent? Do
10:13 18 you understand that's their position?

10:13 19 A. I'm sure that's why we are in the Court. Yeah.

10:13 20 Q. And you're not here to dispute that either?

10:14 21 A. I am not speaking about infringement analysis.
10:14 22 Correct.

10:14 23 Q. Thank you, sir.

10:14 24 MR. MUELLER: I have no further questions.

10:14 25 THE WITNESS: Thank you.

10:14 1 REDIRECT EXAMINATION

10:14 2 BY MR. WASHBURN:

10:14 3 Q. Just a few questions, Professor.

10:14 4 All right. To begin with, Intel's lawyer started your
10:14 5 cross-examination asking you a series of questions about
10:14 6 individuals and certain companies. Do you recall that?

10:14 7 A. Yeah. The two VLSI names he spoke of. Yes.

10:14 8 Q. Was your --

10:14 9 A. And some of the inventors' names, I think he
10:14 10 mentioned. Correct.

10:14 11 Q. Was your work in this case focused on individual
10:14 12 people and companies, or was your work in this case focused on
10:14 13 the benefits of the patented technology?

10:14 14 A. I mean, I'm a technical guy. So I -- my work is
10:15 15 related to the technology analysis and what the power benefits
10:15 16 are.

10:15 17 Q. There were also some questions about whether you --
10:15 18 when you had heard of the '373 patent and the '759 patent. Do
10:15 19 you recall that?

10:15 20 A. Yeah.

10:15 21 Q. All right. In your usual work, are you focused on
10:15 22 reviewing patents or are you focused on your own research and
10:15 23 publishing?

10:15 24 A. Yeah. I don't need to review. I mean, it's not
10:15 25 something that I have to do. No.

10:15 1 Q. Would it be fair for someone to suggest that if you
10:15 2 haven't heard of a patent by number, that means it's not
10:15 3 important?

10:15 4 A. Yeah. Lots of patents are issued every day, and so
10:15 5 it's obviously not possible to track every single patent.

10:15 6 Q. So you would agree then, sir, that there are probably
10:15 7 many important patents that you are not familiar of the numbers
10:15 8 with?

10:15 9 A. I am sure about that. I am not familiar with all the
10:16 10 patents that are being issued on a daily basis.

10:16 11 Q. Now, there were some questions about -- strike that.
10:16 12 Let's go to Paragraph 59.

10:16 13 MR. WASHBURN: Can we bring that up on the screen?

10:16 14 BY MR. WASHBURN:

10:16 15 Q. This is Paragraph 59 of your expert report.

10:16 16 MR. WASHBURN: And, Mr. Simmons, can we bring that up?

10:16 17 Thank you very much.

10:16 18 BY MR. WASHBURN:

10:16 19 Q. Now, Intel's lawyers had a lot of questions about
10:16 20 what you bolded here. Do you recall that?

10:16 21 A. Yes.

10:16 22 Q. And in particular was focused on the fact that you
10:16 23 had bolded some C-states. Do you recall that?

10:16 24 A. Yeah. He mentioned about the Core C7 states,
10:16 25 correct.

10:16 1 Q. Right. Did you also bold the package C-states in
10:16 2 this chart?

10:16 3 A. Yeah. In fact, if you just go down -- oh, yeah.
10:17 4 It's actually here. Just a few rows below, I bolded the
10:17 5 package C7 states, which as I explained are also associated
10:17 6 with the ability to do the mux selection.

10:17 7 Q. Now, given the questions about this paragraph in your
10:17 8 cross-examination, could you explain what you were doing here
10:17 9 and why?

10:17 10 A. So I wanted to sort of bring out to your attention
10:17 11 that Intel's Power Model has many versions offered. You can
10:17 12 think of them as -- if you think of it like a
10:17 13 three-dimensional, there is a third dimension which is
10:17 14 basically, you know, can I use a particular Input 1, Input 2,
10:17 15 Input 3. These are the different kind of inputs that you can
10:17 16 provide.

10:17 17 And when you have those dozens or even more than dozens of
10:17 18 options, you have to pick one that is something that you can
10:18 19 confidently come out and present in front of the jury that
10:18 20 "this makes sense."

10:18 21 And so the best way to do that for me is to run on real
10:18 22 systems, real laptops and then measure the residencies, which
10:18 23 is what you see in this chart, and eventually look for a data
10:18 24 that Intel uses. Not -- this data does not go into any
10:18 25 computation. It's just to find, of the ten choices that I

10:18 1 have, which one should I pick? And I look for something that's
10:18 2 the closest match.

10:18 3 I did not directly use this data to drive my '373
10:18 4 analysis, for example.

10:18 5 Q. Now, you mentioned residency data, and I think there
10:18 6 were some questions referring to residency data. Have any of
10:18 7 Intel's experts identified any other residency data that you
10:18 8 should have used instead?

10:18 9 A. Not to my recollection. Sorry.

10:18 10 Q. Have any of Intel's experts come forward with their
10:19 11 own residency data analysis?

10:19 12 A. I reviewed all their reports. To the best of my
10:19 13 recollection, I don't -- I don't recall them using their own
10:19 14 residency information.

10:19 15 Q. Okay.

10:19 16 MR. WASHBURN: Now, could we please go to Paragraph 137?

10:19 17 BY MR. WASHBURN:

10:19 18 Q. Let me know when you're there.

10:19 19 There were a series of questions about this paragraph. Do
10:19 20 you recall that?

10:19 21 A. Yeah. This is regarding the Fox2, correct.

10:19 22 Q. Yeah. Could you explain what you're describing in
10:19 23 Paragraph 137?

10:19 24 A. So without going into the real weeds of the
10:19 25 discussion, let me sort of explain what I was trying to look

10:20 1 for. The Fox2 tool requires a workload, basically some sort of
10:20 2 an input that emulates how much time the CPU is busy, how much
10:20 3 time the CPU is idle. It needs that input as part of its
10:20 4 computation.

10:20 5 And so when it needs that input, I have to provide that.
10:20 6 And so I was looking to figure out what would be a good way to
10:20 7 provide that input. And so I picked the Broadwell, and I
10:20 8 measured the -- you can think of how fast the processor is and
10:20 9 how often the processor is really fast, how often the processor
10:20 10 is sleeping -- I picked that information, and that's what I
10:20 11 provided as input to the Fox2 tool.

10:21 12 Q. All right. There were some questions --

10:21 13 MR. WASHBURN: We can take that down.

10:21 14 BY MR. WASHBURN:

10:21 15 Q. There were some questions about your testing of Lake
10:21 16 products. Do you recall that?

10:21 17 A. Yes.

10:21 18 Q. Why were you comfortable testing two Lake products in
10:21 19 reaching your conclusions in this case?

10:21 20 A. So for the Lake products, which is the '759, the
10:21 21 analysis is really about the ring domain and whether it has a
10:21 22 Skylake core attached to it. If you think of the ring as a
10:21 23 communication mechanism, you could have different things
10:21 24 connected to it, whether it be a Skylake or a Coffee Lake or a
10:21 25 Kaby Lake, many other options.

10:21 1 But my goal really was how does the ring, which is what is
10:21 2 communicating between these processors -- it's not really about
10:21 3 the processor itself, it's the ring domain.

10:22 4 And so I was trying to figure out what is the ring power
10:22 5 consumption, not what particular processor is attached to it.

10:22 6 Q. Now, you referred a moment ago to ring domain. There
10:22 7 were some questions in your cross-examination about ring
10:22 8 domain. Did Professor Conte have any communication with you
10:22 9 regarding tests of a ring domain?

10:22 10 A. That's -- yeah, that's exactly right. I followed
10:22 11 what Professor Conte asked me to conduct analysis from -- in
10:22 12 terms of analysis.

10:22 13 Q. All right. Now, more generally, there were a lot of
10:22 14 questions from Intel's lawyer regarding how many products you
10:22 15 tested, as discussed in your direct testimony, versus how many
10:22 16 variations on products are in the processor families. Do you
10:22 17 recall those questions?

10:22 18 A. Yes.

10:22 19 Q. Did you think it was necessary to test every variant
10:22 20 of every processor accused of infringing the patents in this
10:23 21 case?

10:23 22 A. So I think I went -- briefly touched upon it in my
10:23 23 direct -- in my presentation in my slides, that the core
10:23 24 underlying technology here, which is whether or not I can
10:23 25 switch or toggle with this mux, is not that directly related to

10:23 1 whether it is two cores or four cores. And so my analysis is,
10:23 2 as a result, focused on those two, but it is applicable to
10:23 3 broader range of systems.

10:23 4 Q. All right. And can you explain why you believe it's
10:23 5 applicable to a broader range of systems?

10:23 6 A. Because the -- if you again look at, for instance --
10:23 7 let me give you a little bit more concrete example.

10:23 8 Imagine that the ring for the '759, I tested with two
10:23 9 cores attached to that ring. What is the purpose of ring? It
10:23 10 is to allow you to communicate with each other, right? I mean,
10:24 11 it's a mechanism for us to talk to each other, basically.
10:24 12 That's what the ring does.

10:24 13 When two people are talking, there is some amount of data
10:24 14 that needs to be sent.

10:24 15 Now, imagine I put four instead of two. What happens to
10:24 16 the communication? More communication occurs. Because more
10:24 17 people need to talk to each other.

10:24 18 What happens if I put eight? Even more communication
10:24 19 occurs.

10:24 20 And what does communication transform into? More power
10:24 21 for the ring, because the ring is going to consume more and
10:24 22 more power as more and more people need to talk on that ring.

10:24 23 And so I picked the most conservative option, which is
10:24 24 when only two people talk, it's the least power-consuming
10:24 25 system. When there are eight people talking, it'll be noisy,

10:24 1 loud. And that's equal then to power, a lot more power.

10:24 2 Q. Now, there were some questions from Intel's lawyer
10:24 3 about whether your testing work was modeling-based or whether
10:25 4 you directly tested products. Do you recall that?

10:25 5 A. Yes.

10:25 6 Q. Would it be realistic to imply that you should have
10:25 7 directly measured the power consumed by an individual circuit
10:25 8 in a consumer product?

10:25 9 A. Not if you have a billion transistors. I mean, it's
10:25 10 difficult to imagine the chip where you're trying to find the
10:25 11 power consumption in some small portion of the chip. It would
10:25 12 be not practical.

10:25 13 Q. Would it be possible with commercially-available
10:25 14 tools to directly measure the power?

10:25 15 A. I've been in the field for many years, and I don't
10:25 16 think there is a way for anybody to measure that level of
10:25 17 breakdown, like this piece within this multibillion transistor
10:25 18 chip. It's not practical.

10:25 19 Q. Did any of Intel's experts do such an analysis?

10:25 20 A. Not that I could recall.

10:25 21 Q. All right. Now, there were some questions suggesting
10:25 22 that results between different processor families could be far
10:25 23 off. Do you recall those questions?

10:26 24 A. Approximately, yes.

10:26 25 Q. All right.

10:26 1 MR. WASHBURN: Could we pull up Slide 28 of Professor
10:26 2 Annavaram's?

10:26 3 BY MR. WASHBURN:

10:26 4 Q. You still have your clicker?

10:26 5 A. Yes.

10:26 6 Q. All right. Could we proceed to the results of your
10:26 7 '759 analysis?

10:26 8 MR. WASHBURN: Sir, could we pull up Professor Annavaram's
10:26 9 slides?

10:26 10 BY MR. WASHBURN:

10:26 11 Q. And I'm going to ask you to navigate to the results
10:26 12 of your '759 analysis.

10:26 13 A. It's not showing.

10:26 14 MR. WASHBURN: Mr. Simmons?

10:26 15 BY MR. WASHBURN:

10:26 16 Q. All right. Well, we can do without slides.

10:26 17 Do you recall the -- well, we're not supposed to say it
10:26 18 out loud, so we actually are going to have to wait for the
10:26 19 slide, unless we can seal the courtroom.

10:26 20 A. I think it's coming up.

10:26 21 Q. Thank you very much, sir.

10:26 22 A. Let me -- no, this is --

10:27 23 Q. All right. Now, sorry for that delay, sir.

10:27 24 Again, there were some questions suggesting that results
10:27 25 from different processor families could diverge greatly. Do

10:27 1 you recall that?

10:27 2 All right. What was the results from your '759 testing in
10:27 3 the Skylake family?

10:27 4 A. Yes. I couldn't say this loud because the numbers
10:27 5 were not allowed to be spoken loud. But I think it's obvious
10:27 6 if you see, this is Skylake number which is the ring bus
10:27 7 domain. And this is Whiskey Lake and the ring bus domain. And
10:27 8 I just want the members of the jury to take a look at those two
10:28 9 numbers. It's hard to tell the difference. They're
10:28 10 essentially identical.

10:28 11 Q. All right. Just a moment, please, sir.

10:28 12 (Conference between counsel.)

10:28 13 BY MR. WASHBURN:

10:28 14 Q. Now, there were some questions about different Lake
10:28 15 products and how many of them you tested. Do you recall that?

10:28 16 A. Yes.

10:28 17 Q. Why did you test two of ten Lake products?

10:28 18 A. Because, again, as I was explaining earlier, for the
10:28 19 '759 I'm interested in the ring bus domain. And if you look at
10:28 20 the two Lake products that I tested, it's 18.8 -- I'm sorry.
10:28 21 The numbers are very close.

10:28 22 And, too, whether I attach a Skylake or I attach a Kaby
10:28 23 Lake or attach a Coffee Lake, some other Lake processor, the
10:29 24 communication is what is causing those systems to burn power.
10:29 25 So I thought it would be appropriate to use two instead of all

10:29 1 the ten.

10:29 2 Q. All right. Thank you very much, Professor.

10:29 3 RECROSS-EXAMINATION

10:29 4 BY MR. MUELLER:

10:29 5 Q. Sir, just a few more questions, if I could.

10:29 6 A. Yes.

10:29 7 Q. Mr. Washburn directed your attention to your report,
10:29 8 Paragraph 59. I'm going to ask you to bring it up again,
10:29 9 Paragraph 59 of your report.

10:29 10 Are you there?

10:30 11 A. I'm there.

10:30 12 Q. So let's just level-set. This is a section of your
10:30 13 report where you were conducting your '373 testing analysis,
10:30 14 correct?

10:30 15 A. That's, I think, a fair statement.

10:30 16 Q. And you understand that what Dr. Conte is alleging as
10:30 17 infringing for that patent is something called the C6 SRAM,
10:30 18 correct?

10:30 19 A. That's my understanding.

10:30 20 Q. And that is one component of many components in the
10:30 21 Haswell and Broadwell family of chips, correct?

10:30 22 A. Again, that is my understanding.

10:30 23 Q. Now, I asked you on my first set of questions to
10:30 24 focus on the column that you bolded that says, "Core C-states."
10:30 25 Do you see that, sir?

10:30 1 A. Yeah. The row that you asked me, yeah, right.

10:31 2 Q. And we can agree that in that particular condition,
10:31 3 the Core C-state condition, C6 SRAM is not being used. We can
10:31 4 agree on that?

10:31 5 A. I agree on that, correct.

10:31 6 Q. Now, Mr. Washburn, on his questions to you just a few
10:31 7 moments ago, scrolled down a little further. Let's do the
10:31 8 same. And he noted that there are also some other rows that
10:31 9 are in bold that say "package C-states." Do you see that, sir?

10:31 10 A. Correct.

10:31 11 Q. But, sir, the row that you used to select the inputs
10:31 12 in the Power Model was the one at the top, right?

10:31 13 A. I don't recall exactly which, because there are a lot
10:31 14 of numbers, but I might have to look at the specific paragraph
10:31 15 or something.

10:31 16 Q. Well, let's just make sure we're on the same page.
10:31 17 Do you see what we've highlighted in yellow --

10:31 18 A. Correct.

10:31 19 Q. -- the Core C7 row, Professor?

10:31 20 A. Correct.

10:31 21 Q. That's the one you used to select the residency
10:31 22 model, correct?

10:31 23 A. My recollection of exact usage, I don't remember, but
10:32 24 maybe that's what I used. Correct.

10:32 25 Q. Well, if it would refresh your memory, you can take a

10:32 1 look at your deposition.

10:32 2 A. Yeah.

10:32 3 Q. It should be Tab 3 in your binder. And take your
10:32 4 time. Why don't you flip to Tab 3?

10:32 5 And I'd like to direct your attention, if I could, sir, to
10:32 6 Page 201, Line 24 to Page 202, Line 12.

10:32 7 And I won't show it to the jury, Your Honor, but just to
10:32 8 refresh the witness' memory?

10:32 9 A. Could you please repeat that page number and the
10:32 10 line?

10:32 11 Q. Yes. It's Page 201, starting at Line 24, carrying
10:32 12 you over to the next page 202, Line 12.

10:33 13 A. Yeah. I reviewed it.

10:33 14 Q. And that refreshes your memory that the line that
10:33 15 we've highlighted in yellow there, the Core C-states, was the
10:33 16 one that you used to select the residency and workload settings
10:33 17 in the Intel Power Model?

10:33 18 A. That's correct. Yes.

10:33 19 Q. And we can agree that the one you used does not
10:33 20 reflect use of C6 SRAM, correct?

10:33 21 A. If it is a Core C7, it doesn't use the C6 SRAM.

10:33 22 Q. Again, sir, the one that's highlighted in yellow,
10:33 23 Core C-states does not use C6 SRAM?

10:33 24 A. That's correct.

10:33 25 Q. And that's the one you used?

10:33 1 A. That's the one I used to match, not to compute.

10:33 2 Q. Now, a few final questions. Mr. Washburn asked you
10:33 3 about your selection of certain models for both your '373
10:33 4 testing and your '759 testing, right?

10:34 5 A. Yeah. I'm not sure which particular question, but he
10:34 6 did ask me.

10:34 7 Q. Now, again you weren't using power testing equipment
10:34 8 on individual chips, right?

10:34 9 A. I mentioned that clearly. No.

10:34 10 Q. And I'm not criticizing you. I'm just trying to make
10:34 11 sure we're on the same page.

10:34 12 A. Okay.

10:34 13 Q. You were using spreadsheets, right?

10:34 14 A. I was using the Power Model and the Fox2, correct.

10:34 15 Q. Now, you used the Power Model for the '373 patent
10:34 16 analysis you did, correct?

10:34 17 A. That is correct.

10:34 18 Q. That's a spreadsheet?

10:34 19 A. It's a spreadsheet with, as you said, hundreds of
10:34 20 thousands of inputs.

10:34 21 Q. And then you used Fox2 for your '759 analysis, right?

10:34 22 A. That is correct.

10:34 23 Q. That's another tool or spreadsheet?

10:34 24 A. It's actually not a spreadsheet. It's more of a
10:34 25 software that actually tracks the PCM usage.

10:34 1 Q. Fair enough. It's a piece of software?

10:34 2 A. Yeah.

10:34 3 Q. And for each of these, you made certain selections
10:34 4 and saw what the results were?

10:34 5 A. Yeah. I think you can say that fairly.

10:34 6 Q. And, sir, the bottom line is for the '373, you only
10:35 7 performed this analysis with respect to two out of hundreds of
10:35 8 processors that are accused, correct?

10:35 9 A. The analysis, as I said, is done on the two parts.

10:35 10 Q. Now, you had the spreadsheet and could have done
10:35 11 more, right?

10:35 12 A. I don't remember all the various queues available in
10:35 13 the spreadsheet.

10:35 14 Q. You could have selected more than two model numbers,
10:35 15 right?

10:35 16 A. I believe it is possible there are more SKUs.
10:35 17 Correct.

10:35 18 Q. And you didn't?

10:35 19 A. Yeah, because the numbers were pretty consistent.

10:35 20 Q. For the '759 patent, you chose two of the ten Lake
10:35 21 series families, correct?

10:35 22 A. That is correct.

10:35 23 Q. You could have done more, right?

10:35 24 A. I mean, they're so close, the 18 point -- I can't --
10:35 25 sorry, I keep messing up the numbers. I shouldn't say the

10:35 1 numbers, but they are pretty close and so I just took those
10:35 2 two. Correct.

10:35 3 Q. You could have done more than two, correct?

10:35 4 A. I could have done more than two, but the numbers were
10:35 5 so close.

10:35 6 Q. But you didn't?

10:35 7 A. No. I didn't.

10:36 8 Q. Thank you, sir.

10:36 9 MR. MUELLER: I have no further questions.

10:36 10 THE WITNESS: Thank you.

10:36 11 FURTHER REDIRECT EXAMINATION

10:36 12 BY MR. WASHBURN:

10:36 13 Q. Professor Annavaram, there were, again, some
10:36 14 questions about Paragraph 59 of your expert report. Do you
10:36 15 recall that?

10:36 16 A. Yes.

10:36 17 Q. All right. I don't know that we need to go through
10:36 18 it again, but just to be completely clear, did any of that data
10:36 19 in that model -- did any of the data on that -- in that
10:36 20 paragraph go into your calculations that led to the results
10:36 21 that you are reporting in this case?

10:36 22 A. So the only reason that that data exists is that you
10:36 23 can pick, of the ten choices that are there, dozens of
10:36 24 choices -- I don't remember, many, many choices -- which of the
10:36 25 choices should I select? And, therefore, it is not used. That

10:36 1 number did not go into my computation. It is just simply, here
10:37 2 are the ten things. Which ones should I pick?

10:37 3 Q. And you were just trying to select the most
10:37 4 representative of Intel's models, right?

10:37 5 A. Closest match. It's not -- it's never going to be --
10:37 6 I had no illusion they would have an exact match, but it would
10:37 7 be the closest to that match because, you know, if you're
10:37 8 running the test and you move your mouse, it has a slightly
10:37 9 different numbers versus if you did not move the mouse. And so
10:37 10 it's not an exact match but possible. So you find the closest
10:37 11 match.

10:37 12 Q. And the -- when you say you found the closest match,
10:37 13 were you looking overall at the different data?

10:37 14 A. Yeah. So, in fact, I have looked at not just one
10:37 15 number to match. I was looking across this whole spectrum of
10:37 16 numbers to find -- looking for something like a correlation
10:37 17 across multiple numbers.

10:37 18 Q. All right. Now, there were some questions about
10:37 19 whether you tested a few, the variants in the processor family
10:37 20 or whether you tested all 300. Do you recall that?

10:37 21 A. Yeah. Various SKUs that was mentioned.

10:38 22 Q. Do you know how much it would have cost to test -- to
10:38 23 do all 300 tests, how much time it would have taken?

10:38 24 A. I can't hazard a guess. It took, as they -- it was
10:38 25 brought up it was already many hundreds of hours to do this

10:38 1 analysis.

10:38 2 Q. All right. Now, were there other considerations in
10:38 3 selecting the Power Model that you used in your testing?

10:38 4 A. So these are tools provided and used by Intel, and
10:38 5 they are tools doubled up with thousands hours of immense
10:39 6 research and engineering effort from Intel. And if there's any
10:39 7 one reason, that's a strong reason from my viewpoint, from a
10:39 8 scientifically, technically solid viewpoint. It's been
10:39 9 validated, tested, doubled up, so I would want to use them.

10:39 10 Q. Based upon on your experience with academic research,
10:39 11 do you believe that the tests you did were representative of
10:39 12 the accused products as a whole?

10:39 13 A. So since the basic underlying technology -- and I
10:39 14 think I mentioned this already if you're not bored by it -- is
10:39 15 the same concept, whether it is a ring, whether it's a
10:39 16 different processor attached to it, or whether it's the ring
10:39 17 that's doing the communication, I think it's fair to say that
10:39 18 what I have done is a good representation of the various
10:39 19 products.

10:39 20 Q. All right. Thank you, sir. No further questions.

10:40 21 MR. MUELLER: I have no further questions, Your Honor.
10:40 22 Thank you.

10:40 23 THE COURT: May this witness be excused?

10:40 24 MR. MUELLER: Yes, Your Honor.

10:40 25 THE COURT: You may step down. Thank you, sir.

10:40 1 Ladies and gentlemen of the jury, I think this is a good
10:40 2 time for us to take our break. It is 10:40. Why don't we
10:40 3 gather back together at five minutes before 11:00?

10:40 4 Remembering my instructions not to discuss the case
10:40 5 amongst yourselves. We'll be back in a few minutes.

10:40 6 THE BAILIFF: All rise.

10:40 7 (Jury exited the courtroom at 10:40.)

10:40 8 THE COURT: You may be seated.

10:40 9 Who is your next witness? Dr. Sullivan? Is your next
10:41 10 witness Dr. Sullivan?

10:41 11 MS. PROCTOR: Yes, Your Honor. He's our next live
10:41 12 witness.

10:41 13 THE COURT: Okay. Is there anything we need to take up
10:41 14 before we take a break?

10:41 15 MR. LEE: Just one thing, Your Honor. There was a mention
10:41 16 today of offering some written discovery. We haven't had
10:41 17 notice that anything was going to be offered. If they could
10:41 18 just tell us what they're going to offer so that if we have any
10:41 19 issues to raise with Your Honor, we can raise them without the
10:41 20 jury.

10:41 21 THE COURT: For sure.

10:41 22 Mr. Chu or whomever, if you are going to offer -- I mean,
10:41 23 you certainly are entitled to do it, but if you're going to put
10:41 24 into evidence responses to -- if either side is going to put in
10:41 25 responses to discovery, please let the other side know in

10:41 1 advance so they can have any counter-answers that they want to
10:41 2 make sure are put in.

10:41 3 Does that make sense?

10:41 4 MR. CHU: Of course we'll let them know in advance, and
10:41 5 then whether it's proper to have a counter or not is an open
10:42 6 question. So I don't know what they --

10:42 7 THE COURT: Well, you get to put in what you want, and
10:42 8 they get to put in what they want.

10:42 9 MR. CHU: Absolutely.

10:42 10 THE COURT: Anything else, Mr. Chu?

10:42 11 MR. CHU: No.

10:42 12 THE COURT: Mr. Lee?

10:42 13 MR. LEE: No, Your Honor.

10:42 14 THE COURT: Okay. We'll be back in a few minutes.

10:42 15 THE BAILIFF: All rise.

10:42 16 (Recess taken from 10:42 to 10:57.)

10:57 17 THE BAILIFF: All rise.

10:57 18 THE COURT: Please remain standing.

10:57 19 (The jury entered the courtroom at 10:57.)

10:58 20 THE COURT: Thank you. You may be seated.

10:58 21 Counsel, you may call your next witness.

10:58 22 MS. PROCTOR: Thank you, Your Honor. We'd like to call
10:58 23 Dr. Ryan Sullivan.

10:58 24 (The witness was sworn.)

10:58 25 THE COURT: Counsel, I'm going to be relying on you all to

10:58 1 let me know when we need to shift to the nonpublic forum.

10:58 2 MS. PROCTOR: And, Your Honor, we're going to try to just
10:58 3 have the slides up and to not say confidential numbers out loud
10:58 4 so that we can maintain public access to as much of this
10:58 5 proceeding as possible.

10:58 6 THE COURT: Perfect.

10:59 7 MS. PROCTOR: And Intel's welcome to object at any time if
10:59 8 they have any concerns about that.

10:59 9 MR. LEE: Your Honor, just a few things. There's actually
10:59 10 confidential information both ways, but we'll address it with
10:59 11 Your Honor, and I think when the slide is up for the jurors, we
10:59 12 just need to turn the public monitor off.

10:59 13 THE COURT: We'll do that.

10:59 14 DIRECT EXAMINATION

10:59 15 BY MS. PROCTOR:

10:59 16 Q. So good morning, Dr. Sullivan.

10:59 17 A. Good morning.

10:59 18 MS. PROCTOR: And good morning, everyone on the jury.

10:59 19 BY MS. PROCTOR:

10:59 20 Q. My name is Amy Proctor, and I'm part of the team with
10:59 21 Mr. Chu and Mr. Washburn representing VLSI in this proceeding.
10:59 22 So now that I've introduced myself, Dr. Sullivan, can you
10:59 23 please introduce yourself to the jury?

10:59 24 A. Yes. Good morning. My name is Ryan Sullivan. I
10:59 25 serve as president of a company that is known as Intensity, and

10:59 1 I work as an economist. So that means that I use data and
10:59 2 market information to evaluate and analyze revenue costs and
11:00 3 profitability.

11:00 4 Q. And why are you here today, Dr. Sullivan?

11:00 5 A. I am here to provide my -- describe my expert
11:00 6 analysis and provide my expert opinions regarding the economic
11:00 7 damages that were incurred by VLSI as a result of the alleged
11:00 8 infringement by Intel.

11:00 9 Q. And have you prepared anything to assist with your
11:00 10 testimony?

11:00 11 A. Yes. I have a set of demonstratives that I have
11:00 12 created.

11:00 13 Q. Can we pull those up, please?

11:00 14 BY MS. PROCTOR:

11:00 15 Q. Would you please describe your educational
11:00 16 background?

11:00 17 A. Yes. I have a bachelor's degree, a masters degree
11:00 18 and a Ph.D. They are all in economics and all from the
11:00 19 University of California in San Diego.

11:00 20 Q. Have you published any work, Dr. Sullivan?

11:00 21 A. Yes. I have. I have published several articles in
11:00 22 what are considered top-tier, peer-reviewed academic journals.
11:01 23 I've also published a paper in the Licensing Executive
11:01 24 Society's Journal as well as other articles on intellectual
11:01 25 property and the economics thereof.

11:01 1 Q. And what type of work do you do?

11:01 2 A. I have been providing professional economic services
11:01 3 for over 28 years now. This comes into really three categories
11:01 4 for me currently.

11:01 5 So I work with companies to help with what is referred to
11:01 6 as strategic decision making, and this is where I do work such
11:01 7 as valuation, licensing and building statistical models to help
11:01 8 companies as they're competing in the marketplace.

11:01 9 I also serve providing expert analysis and testimony in
11:01 10 cases such as this one. And I also provide strategic guidance
11:01 11 to the firm that I work with.

11:02 12 Although it varies from time to time, currently I spend
11:02 13 about 50 percent of my time working on cases on litigation
11:02 14 matters.

11:02 15 Q. What types of companies have you worked with?

11:02 16 A. Oh, I have worked with all kinds of companies, large
11:02 17 and small. In the technology arena, I have worked on behalf of
11:02 18 IBM, Microsoft, Apple and Adobe as a few examples.

11:02 19 Q. Have you worked for any not-for-profit organizations?

11:02 20 A. Yes. I have. I have had the -- the honor, really,
11:02 21 to serve as treasurer and an officer on the board of trustees
11:02 22 for San Diego Zoo Global, which is oftentimes thought of as one
11:02 23 of the world's premier wildlife organizations.

11:02 24 Q. Have you worked with my law firm in other cases?

11:02 25 A. Yes. I have, on a number of occasions.

11:02 1 Q. And have you been qualified to testify in any trials?

11:03 2 A. Yes. I have provided testimony in more than 25

11:03 3 trials at this point.

11:03 4 Q. Have you testified on behalf of both plaintiffs and

11:03 5 defendants?

11:03 6 A. I have. Approximately half of my work is on behalf

11:03 7 of plaintiffs or patent holders and the other half on behalf of

11:03 8 defendants or alleged infringers.

11:03 9 Q. Is your firm, Intensity, being compensated for your

11:03 10 time in this matter?

11:03 11 A. Yes. Intensity is compensated at a rate of \$1,150

11:03 12 per hour for my time.

11:03 13 Q. Now, does that compensation depend on the outcome of

11:03 14 this case?

11:03 15 A. No. Not at all.

11:03 16 MS. PROCTOR: Your Honor, I would like to offer Dr. Ryan

11:03 17 Sullivan as an expert on economics, finance, statistics and

11:03 18 patent damages.

11:03 19 MR. LEE: No objection, Your Honor.

11:03 20 THE COURT: He'll be admitted as an expert.

11:03 21 MS. PROCTOR: Thank you.

11:03 22 BY MS. PROCTOR:

11:03 23 Q. So, Dr. Sullivan, what were you asked to do in this

11:04 24 case?

11:04 25 A. As I mentioned a few moments ago, I was asked to

11:04 1 evaluate the damages incurred by VLSI as a result of the
11:04 2 alleged infringement by Intel.

11:04 3 And more specifically, I was asked to calculate a specific
11:04 4 form of damages that are known as reasonable royalties for each
11:04 5 of the two patents at issue here, the '373 patent and the '759
11:04 6 patent.

11:04 7 Q. What did you consider in forming your opinions?

11:04 8 A. I reviewed and considered and evaluated a great deal
11:04 9 of information in my work. Of course I considered the patents
11:04 10 at issue themselves, but I also examined financial data, market
11:04 11 research and company documents.

11:04 12 I've also evaluated testimony of other witnesses and
11:04 13 reviewed expert reports. So there's been a great deal of
11:04 14 information that I have considered.

11:04 15 Q. And can you describe the work that you did in this
11:05 16 case?

11:05 17 A. Yes. So it would have been in the summer of last
11:05 18 year, of 2020, that I submitted a report. And this consisted
11:05 19 of about 128 pages of written description of the work that I
11:05 20 did, along with over 400 footnote citations to underlying and
11:05 21 supporting evidence and information.

11:05 22 My report also consisted of over 1200 pages of data,
11:05 23 tables and charts, along with computer code that I used in
11:05 24 performing my analysis. And the purpose of my report is to
11:05 25 provide full transparency of the work that I did, both to Intel

11:05 1 and its experts, as well as to the Court, for review and
11:05 2 consideration.

11:05 3 Q. So what products are accused of infringement here?

11:05 4 A. For the '373 patent, it is the Broadwell and Haswell
11:06 5 products. And for the '759 patent, there are ten different
11:06 6 product families, and those are all in the Lake families, such
11:06 7 as Skylake, Cannon Lake and Ice Lake.

11:06 8 Q. Are any of these products accused under both patents?

11:06 9 A. No. They are not. It is two separate sets of
11:06 10 products that are accused of infringement under each of the
11:06 11 different patents, and this reflects the different
11:06 12 contributions that those patents can make. And in part, that
11:06 13 can be seen because there are different numbers of units that
11:06 14 have been sold that are accused of infringement.

11:06 15 For example, for the '373 patent, here on Slide 7.5,
11:07 16 you'll see that there are approximately 384 million units
11:07 17 accused of infringing the '373 patent.

11:07 18 And for the '759 patent, there are approximately 603
11:07 19 million units that have been accused of infringement.

11:07 20 Q. So what is the total number of units that are accused
11:07 21 of infringing in this case?

11:07 22 A. Approximately 987 million units that Intel has sold
11:07 23 of the allegedly infringing units.

11:07 24 Q. And have you personally analyzed whether those
11:07 25 987 million units actually infringe the two patents?

11:07 1 A. No. I have no opinion on whether the products
11:07 2 actually infringe or not. As an economist who is providing
11:07 3 expertise on the calculation of damages, it is my role to
11:07 4 simply assume that the products do infringe for purposes of my
11:08 5 analysis, and thus I refer to the products as either "accused
11:08 6 products" or "infringing products" for that reason.

11:08 7 Q. Now, I believe you mentioned earlier a reasonable
11:08 8 royalty. What is a reasonable royalty?

11:08 9 A. A reasonable royalty is the form of damages that
11:08 10 apply in this particular case.

11:08 11 So in looking at the legal statute, it states that
11:08 12 "damages should be adequate to compensate for the infringement,
11:08 13 but in no event less than a reasonable royalty for the use made
11:08 14 of the invention by the infringer."

11:08 15 So there are two key points here. The first is that the
11:08 16 reasonable royalty is the minimum amount of damages, and the
11:08 17 second key point is that it is based upon the use of the
11:08 18 technology by the infringer.

11:08 19 Q. Now, Dr. Sullivan, how did you determine a reasonable
11:08 20 royalty in this case?

11:08 21 A. The most typical and appropriate way to calculate
11:09 22 damages in a reasonable royalty is through what is known as a
11:09 23 hypothetical negotiation. So this is a negotiation that would
11:09 24 have occurred right at the eve of infringement back in time.

11:09 25 And it's hypothetical because it did not actually happen,

11:09 1 otherwise, we all would not be sitting here today.

11:09 2 And it's kind of an interesting framework work for us to
11:09 3 work within, because it's a situation where the parties
11:09 4 understand that they have to come to an agreement based upon
11:09 5 certain requirements of that negotiation.

11:09 6 And more specifically, at this negotiation, the parties
11:09 7 would recognize that the patent is valid, and they would agree
11:09 8 to that. They would recognize that the patent is infringed,
11:10 9 and they would agree to that, which would, of course, include
11:10 10 consideration for the unit sales that would be forthcoming that
11:10 11 would be sold under those infringing technologies, and also
11:10 12 that it includes a willing licensor and a willing licensee.

11:10 13 Now, the licensor, that's the patent holder. And the
11:10 14 licensee is the alleged infringer. That's the entity that
11:10 15 would be seeking a license. They'd be looking to pay a
11:10 16 particular amount to the patent holder in order to have rights
11:10 17 to use that technology.

11:10 18 And because of the construct of this hypothetical
11:10 19 negotiation, neither party can simply walk away from this
11:10 20 negotiation, but rather they have to be willing to enter into
11:10 21 that agreement. And that's part of the fundamental nature of
11:10 22 this negotiation.

11:10 23 Q. Who would have participated in the hypothetical
11:10 24 negotiation in this case?

11:11 25 A. Here, the patent holder, the licensor would be

11:11 1 Freescale, and the licensee that would be looking to obtain
11:11 2 rights to the patents is Intel.

11:11 3 And these hypothetical negotiations for the '373 patent
11:11 4 would occur around October 2011 and for the '759 patent around
11:11 5 June 2013. And this is the time period right when Intel began
11:11 6 its infringement through the testing of the technologies.

11:11 7 Q. And what information should be used to determine a
11:11 8 reasonable royalty?

11:11 9 A. Well, really it's all relevant information. Even
11:11 10 though it's called a hypothetical negotiation, it really is
11:11 11 grounded in real-world facts.

11:11 12 What's interesting about a hypothetical negotiation is
11:12 13 unlike -- it's kind of like playing a card game where all the
11:12 14 cards are out on the table for both sides to see.

11:12 15 So, you know, when we're typically playing a card game, we
11:12 16 think of, oh, we've got to, you know, hold our cards close to
11:12 17 our chest so nobody can see.

11:12 18 But this is very different. This is -- this construct,
11:12 19 this legal framework for calculating damages puts all of the
11:12 20 cards out on the table so that both sides can see. That means
11:12 21 that the confidential and top secret information of Intel in
11:12 22 terms of sales, in terms of financials, in terms of the way
11:12 23 their products work and the testing, that's available out on
11:12 24 the table for both parties to see.

11:12 25 And that's a fundamental aspect of this negotiation, which

11:12 1 makes it a little bit different than as you might think of as
11:12 2 just a standard real-world negotiation.

11:12 3 Q. And why is Freescale, the patent holder, at the
11:13 4 hypothetical negotiation?

11:13 5 A. So at the time of these negotiations in 2011 and
11:13 6 2013, that's at the time of Freescale owning the patents. And
11:13 7 because Freescale owned the patents, they are the entity, the
11:13 8 licensor at the hypothetical negotiation that owns those
11:13 9 patents. Because, you know, before that time -- this is the
11:13 10 time period after the acquisition of SigmaTel, but it's before
11:13 11 NXP acquired Freescale. And so it's Freescale who is at the
11:13 12 hypothetical negotiation.

11:13 13 Q. And what is Freescale's position in the hypothetical
11:13 14 negotiation?

11:13 15 A. Well, Freescale as the patent holder would be the one
11:13 16 that would be granting rights to the technology. You know,
11:13 17 they started off as the chip division of Motorola. And then in
11:14 18 2004, they became their own independent company.

11:14 19 They developed into a global leader in microcontrollers,
11:14 20 employing over 20,000 individuals headquartered in Austin with
11:14 21 a focus on innovation. Freescale was investing approximately
11:14 22 \$1 billion each year in research and development.

11:14 23 Q. And what is Intel's position in the hypothetical
11:14 24 negotiation?

11:14 25 A. Intel is the entity that would be requiring a license

11:14 1 in order to be able to use the patented technology. And Intel
11:14 2 is the world's dominant manufacturer of processors, and they
11:14 3 would be seeking a license to the technology to help them
11:14 4 maintain their position in the competitive marketplace.

11:14 5 Q. Dr. Sullivan, are you familiar with the
11:15 6 Georgia-Pacific factors?

11:15 7 A. Yes. I am. They are a set of 15 factors that were
11:15 8 set forth by a court back in 1970, and some of these factors
11:15 9 can be useful in providing guidance for determining a
11:15 10 reasonable royalty. So I reviewed, considered and analyzed all
11:15 11 15 of these factors as part of my analysis.

11:15 12 Q. Did you find any of those 15 Georgia-Pacific factors
11:15 13 to be particularly relevant to your work?

11:15 14 A. Yes. Factor 5 relates to the commercial relationship
11:15 15 between the parties. And because Freescale and Intel had a
11:15 16 competitive relationship, this highlights the importance of the
11:15 17 competitive nature of the marketplace.

11:15 18 Factors 9, 10 and 14 relate to the importance of the
11:15 19 patents.

11:15 20 Whereas Factors 8, 11 and 12 relate to the value of the
11:16 21 technology to Intel. In particular, Factor 11 relates to the
11:16 22 extent of use of the patented technology by Intel.

11:16 23 And Factor 13 relates to the relative contributions that
11:16 24 both Freescale and Intel made to the additional revenues and
11:16 25 profitability that were provided by the patented technology.

11:16 1 Q. So with that context, what is the proper approach to
11:16 2 determining damages here?

11:16 3 A. Well, first off, the proper analysis should reflect
11:16 4 the infringing product sales, the amount of those sales and
11:16 5 thus the extent of use.

11:16 6 Second, it should -- the proper analysis should reflect
11:16 7 the actual benefits of the technology. And this can be
11:16 8 determined through the testing that has been performed on the
11:17 9 accused products.

11:17 10 And this is important because it allows the damages and
11:17 11 the royalty to be apportioned to the specific contributions of
11:17 12 the patented technology separate and apart from all the other
11:17 13 features, functionalities and contributions to Intel's
11:17 14 products.

11:17 15 And, third, it should be based upon the value of the use
11:17 16 of the technology by Intel.

11:17 17 Q. Now, Dr. Sullivan, in your opinion, do Intel's
11:17 18 damages experts apply a proper damages analysis here?

11:17 19 A. In my view, no. And I'll explain that as we go.

11:17 20 Q. So let's turn now to the first key topic you
11:17 21 identified, the competitive marketplace.

11:17 22 How would you describe the marketplace in which Intel
11:17 23 competes?

11:17 24 A. Based upon all the research I've done, the statements
11:18 25 and documents from Intel, it is clear that this is a highly

11:18 1 competitive marketplace where innovation improvements are
11:18 2 required in order to maintain one's competitive position.

11:18 3 Q. Can we pull up your slide on Plaintiff's Exhibit
11:18 4 2617? What is this exhibit?

11:18 5 A. This is what is known as a 10-K filing. It's an
11:18 6 annual report that is prepared by Intel and submitted to the
11:18 7 United States Securities and Exchange Commission.

11:18 8 This is a particular 10-K for the year 2013, and this
11:18 9 information is provided by Intel with a fiduciary
11:18 10 responsibility to be truthful.

11:18 11 Here you can see, at Page 8 of PTX-2617, that Intel is
11:19 12 explaining that the computer industry continuously evolves and
11:19 13 that Intel faces significant competition.

11:19 14 Q. And would you please turn to your slide on
11:19 15 Plaintiff's Exhibit 2618? What is this document?

11:19 16 A. This is another 10-K report that was filed by Intel.
11:19 17 This one is for the year 2019. So here on PTX-2618 at Page 33,
11:19 18 you can see that they state that they are expecting "an
11:19 19 increasingly competitive environment in 2020."

11:19 20 And this is demonstrating that not only was the industry
11:19 21 competitive, but it has continued to be competitive and is
11:19 22 expected to continue to be competitive. Just by way of one
11:19 23 example, recently Apple, who had been purchasing their chips
11:20 24 from Intel for their Mac computers, recently decided to stop
11:20 25 having Intel supply chips for the Macs.

11:20 1 Q. So let's turn now to the second key topic you
11:20 2 identified, and that was the importance of the patents. Can
11:20 3 you describe the benefits provided by these two VLSI
11:20 4 patents-in-suit?

11:20 5 A. Yes. My understanding, based upon the work that was
11:20 6 performed by Professor Conte and Professor Annavaram, is that
11:20 7 the '373 patent provides power savings and that the '759
11:20 8 patent, through its role with Speed Shift technology, provides
11:20 9 performance improvements.

11:20 10 Q. And in thinking about the benefits of these patents,
11:20 11 is it relevant whether Freescale or NXP or SigmaTel ever
11:20 12 incorporated the asserted patents into specific products?

11:21 13 A. No, it is not. That particular issue is not relevant
11:21 14 and typically would be considered a red herring issue. That
11:21 15 means that it's a distraction from that which is actually
11:21 16 relevant.

11:21 17 And you can see that because the value of the technology
11:21 18 as it relates to calculating damages for determining a
11:21 19 reasonable royalty, that is to be based upon the use and value
11:21 20 to Intel, not the use or potential use or value at NXP, at
11:21 21 Freescale or at SigmaTel.

11:21 22 It's also what I would consider to be a misleading issue,
11:21 23 because large technology companies such as Freescale, NXP, they
11:21 24 do not have a practice of determining which products of theirs
11:22 25 use which patents.

11:22 1 It's actually -- to be able to do that is a very expensive
11:22 2 and resource-intensive endeavor, to be able to do that for all
11:22 3 of their patents and all of their products.

11:22 4 And yet, even though it is very expensive to do, it
11:22 5 doesn't yield them value, right? They don't gain any
11:22 6 additional innovation as a result of that, right? They want to
11:22 7 be able to have the innovation and the benefits of that
11:22 8 innovation.

11:22 9 So even though you might see in certain products -- I
11:22 10 remember this particularly for my children's toys. Some of
11:22 11 them would be marked with, you know, a patent on it, and that
11:22 12 makes sense, right? Because there's maybe a very clear patent
11:22 13 on that particular product. Sometimes you'll see it on
11:22 14 beverages, on particular cans or tops that open, things of that
11:23 15 nature.

11:23 16 But what we're talking about here are computer chips. And
11:23 17 as you have observed, they are complex. They're not simple.
11:23 18 And as a result, companies such as Intel, NXP, they do not mark
11:23 19 their products with patents as a simple matter of industry
11:23 20 practice.

11:23 21 Q. So rather than focusing on NXP's products or
11:23 22 Freescale's products, you focused on Intel's products, right?

11:23 23 A. Exactly.

11:23 24 Q. Now, are these power savings and performance
11:23 25 improvements to Intel's products, are they important to Intel

11:23 1 and to Intel's customers?

11:23 2 A. Yes, they are. So here on Slide 7.20, I have here a
11:23 3 quote from PTX-4112 at Page 27. And this is in relation to a
11:24 4 presentation that Intel put together where they state that
11:24 5 "it's the biggest Gen-Over-Gen improvement in battery life in
11:24 6 Intel's history."

11:24 7 Gen-Over-Gen means generation-over-generation. And this
11:24 8 is exemplifying the importance of the '373 patent to Intel.

11:24 9 Here I also have listed a quote from PTX-4032 at Page 19,
11:24 10 and this is a 2016 presentation that Intel created. And they
11:24 11 state that "a new revolutionary approach to power performance
11:24 12 management." And this is explaining and demonstrating the
11:24 13 importance of the benefits of the '759 patent to Intel.

11:24 14 Q. Have you seen any --

11:24 15 MR. LEE: Your Honor, just for the record, PTX-4112 is one
11:25 16 of these documents that has numbers in it. I have no objection
11:25 17 to the portion coming in that's on the slide. It would be
11:25 18 anything else that would follow that would be subject to the
11:25 19 objection.

11:25 20 THE COURT: Okay.

11:25 21 MS. PROCTOR: We'll take that up with them after.

11:25 22 THE COURT: Yes, ma'am.

11:25 23 BY MS. PROCTOR:

11:25 24 Q. Have you seen any other evidence that these
11:25 25 performance benefits and power savings are important to Intel

11:25 1 and to its customers?

11:25 2 A. Yes. In my report I list out many, many, many
11:25 3 documents in this regard. What I have here on Slide 7.21 is
11:25 4 just a handful of these documents. It includes competitive
11:25 5 analyses prepared by Intel, pricing strategies prepared by
11:25 6 Intel, additional 10-K filings from Intel, their website, press
11:25 7 releases, news items.

11:25 8 So there's a great deal of information demonstrating that
11:26 9 the patented benefits are important. And it also demonstrates
11:26 10 that these benefits help Intel improve their pricing.

11:26 11 MR. LEE: Your Honor, same objection as to anything else
11:26 12 that would follow. No objection at all to what's being shown
11:26 13 to the jury.

11:26 14 THE COURT: Okay.

11:26 15 BY MS. PROCTOR:

11:26 16 Q. Now, you mentioned pricing. Does Intel price its
11:26 17 products based at least in part on performance?

11:26 18 A. Yes, they do. And here is an excerpt from PTX-4125
11:26 19 at Page 20. And this is a price strategy document for
11:26 20 Broadwell that was prepared by Intel in 2015.

11:26 21 And you can see down here at the bottom, which I have
11:26 22 expanded up here at the top, that Intel states "Continued
11:26 23 strong demand for performance. There is still room to test
11:27 24 elasticity of demand on top of the stack."

11:27 25 And elasticity of demand, this is an economic principle.

11:27 1 And what this is saying is that because of the demand for
11:27 2 performance, Intel is able to continue to increase their prices
11:27 3 without that causing them to lose so many sales that their
11:27 4 revenue would go down.

11:27 5 So in other words, they have the ability because of higher
11:27 6 performance to increase their prices and increase revenue, and
11:27 7 of course then profitability.

11:27 8 Q. Have you seen any testimony supporting this
11:27 9 relationship between price and performance?

11:27 10 A. Yes, I have. There are several Intel witnesses on
11:27 11 pricing that have testified that pricing is based, in part, on
11:27 12 the performance of the products.

11:27 13 Q. Now, what is your primary takeaway from reviewing all
11:27 14 of these materials in your work on this case?

11:27 15 A. Well, I think it's clear that Intel operates in a
11:28 16 competitive marketplace where power savings and performance
11:28 17 improvements are necessary for them to maintain their
11:28 18 competitive position.

11:28 19 Q. Thank you, Dr. Sullivan.

11:28 20 So let's turn now to the third key topic that you
11:28 21 identified, and that was the value of the patents to Intel.
11:28 22 How did you go about determining this value?

11:28 23 A. I developed and used a quantitative mathematical
11:28 24 analysis -- it's known as a regression analysis -- that
11:28 25 measures and quantifies the price effects or price benefits

11:28 1 that are attributable to the patented benefits separate and
11:28 2 apart from other features and functionalities that contribute
11:28 3 to Intel's prices.

11:28 4 Q. And what are the inputs to your analysis?

11:28 5 A. Well, there's a couple of them to start with, which
11:29 6 are the patented benefits that were determined based upon the
11:29 7 work of Professor Annavaram and Professor Conte.

11:29 8 For the '373 patent you may recall that they determined
11:29 9 that the patented technology provides power savings of
11:29 10 5.45 percent.

11:29 11 For the '759 patent they determined that the technology
11:29 12 provides a performance improvement of 1.11 percent. And I used
11:29 13 these as inputs to my analysis.

11:29 14 Q. And how are these inputs used in your analysis? Do
11:29 15 they allow you to focus just on the benefits that VLSI's
11:29 16 patents provide?

11:29 17 A. They do. And that, in my view, is part of why using
11:30 18 the actual tested benefits is so important in calculating a
11:30 19 reasonable royalty. Because it identifies the specific
11:30 20 benefits of the patented technologies, which is what the
11:30 21 royalty is intended to do. And that way it's separate from any
11:30 22 other factors and functionalities. It allows this
11:30 23 apportionment to the technology specifically.

11:30 24 Q. So how do you actually use these inputs provided by
11:30 25 Professors Conte and Annavaram in your analysis?

11:30 1 A. Well, first off, I understand from Professor Conte
11:30 2 that a 1 percent power savings or a 1 percent improvement in
11:30 3 performance can be valued as a 1 percent improvement in clock
11:30 4 speed.

11:30 5 And as a matter of economics, this makes really good
11:30 6 sense. Because if Intel has opportunity to improve performance
11:31 7 or reduce power, there's multiple things that they can do with
11:31 8 that. They can increase clock speed with that. They could
11:31 9 reduce power or they could improve other aspects of
11:31 10 performance.

11:31 11 And because they can choose how best to use these
11:31 12 benefits, they can choose the most valuable one. And thus, if
11:31 13 they choose to increase clock speed, that might be the best
11:31 14 opportunity for them, but they might have something that's even
11:31 15 better.

11:31 16 So what I look at is the improvement in clock speed,
11:31 17 because we know that the benefits of the technology are at
11:31 18 least as valuable as an improvement in clock speed, because
11:31 19 Intel has these other options.

11:31 20 Q. So what benefit does Intel actually get from an
11:31 21 increase in clock speed?

11:31 22 A. Higher prices. If the technology provides the
11:32 23 opportunity for power savings and performance improvements, and
11:32 24 we know that can be valued as an increase in clock speed, this
11:32 25 results in higher prices.

11:32 1 Customers like higher clock speed, and thus, they are
11:32 2 willing to pay for it.

11:32 3 Q. So how do you actually quantify the effect of clock
11:32 4 speed on Intel's pricing?

11:32 5 A. Well, as I mentioned earlier, I create a quantitative
11:32 6 analysis to be able to do this.

11:32 7 To start off with, it's probably easiest to think about a
11:32 8 simple analogy. Earlier we were hearing about some Ford
11:32 9 vehicles, and maybe that was recognizing that I was going to be
11:32 10 wanting to talk about some Ford Explorers.

11:32 11 So suppose we have two types of vehicles, two Ford
11:32 12 Explorers, okay? On the left is our standard Ford Explorer,
11:33 13 and then on the right we have another one. Except this one's a
11:33 14 little different, because it has what I'm going to call a
11:33 15 lightning bolt technology.

11:33 16 Think about this as something -- the technology that
11:33 17 allows the fuel efficiency to increase from 25 miles per gallon
11:33 18 to 30 miles per gallon. And as a result, the price of the
11:33 19 vehicle increases from \$32,000 to \$35,000.

11:33 20 So the difference between the 32,000 and the 35,000, you
11:33 21 know, that's our \$3,000.

11:33 22 So in this simple example, one can see that if one's
11:33 23 focused on the lightning bolt technology and you have these two
11:33 24 products, you can observe that the price effect is \$3,000 for a
11:33 25 lightning bolt.

11:33 1 Q. So in your work here, did you find identical Intel
11:33 2 products that allowed you to do that type of direct comparison?

11:33 3 A. No. Intel does not have two sets of products where
11:34 4 one set has the technology and the other set does not but is
11:34 5 otherwise identical.

11:34 6 Q. So how do you quantify the price effects when the
11:34 7 products are not otherwise identical?

11:34 8 A. Well, it's a bit more complicated.

11:34 9 So going back to this car analogy, now, instead of our
11:34 10 having a Ford Explorer, suppose we have a Ford Escape. Similar
11:34 11 but different. It's a smaller vehicle; it costs less. It does
11:34 12 not carry as many passengers, has lower horsepower.

11:34 13 So it makes it a bit more complicated because now we're
11:34 14 not just trying to control for the lightning bolt technology in
11:34 15 this comparison, we also have to control for these other
11:34 16 differences between the vehicles.

11:35 17 Q. So in this type of a more complicated situation, how
11:35 18 do you isolate the value of a single factor on price?

11:35 19 A. There is a tool that is specifically designed for
11:35 20 this purpose, and it's referred to as regression analysis. And
11:35 21 I mentioned that term earlier. This is a mathematical or a
11:35 22 statistical tool, framework, method that allows one to examine
11:35 23 the effects of clock speed on price while accounting for the
11:35 24 other differences among the products.

11:35 25 Q. And how are regression models typically used?

11:35 1 A. Well, regression analysis has been around for a long
11:35 2 time. It was first created over 200 years ago. And it is now
11:35 3 very widely used throughout companies, universities. It is
11:36 4 taught in basic courses in statistics, basic economics courses,
11:36 5 econometrics describe regression analysis.

11:36 6 It is the subject of thousands of academic journal
11:36 7 articles. It is in many different textbooks. It's -- certain
11:36 8 types of regression analysis have been the focus of the Nobel
11:36 9 Prize in economics.

11:36 10 I was fortunate to study and have one of my dissertation
11:36 11 advisors, he earned his Nobel Prize for a particular type of
11:36 12 regression analysis called Arch. And so this is a very widely
11:36 13 used, widely studied methodology.

11:36 14 Q. And is regression analysis used in the context of
11:36 15 litigation for determining damages?

11:36 16 A. Yes. It is very common for regression analysis to be
11:37 17 used in litigation. One example of this is that the Federal
11:37 18 Judicial Center, which is the educational organization for the
11:37 19 federal courts, they have manuscripts that describe how to use
11:37 20 regression in litigation. It is very commonly used.

11:37 21 Q. So what about outside of litigation? Is regression
11:37 22 ever used in negotiations that are separate, not involving any
11:37 23 litigation?

11:37 24 A. It is. For negotiations for a patent license, it
11:37 25 does get used, but it's less common. Because there are certain

11:37 1 data requirements, and it also takes resources, time to put
11:37 2 towards it. It's not an inexpensive endeavor, and so it's used
11:38 3 sometimes but not overly frequently.

11:38 4 Q. Now, does Intel dispute that regression is a widely
11:38 5 used tool in economics?

11:38 6 A. No. They do not. You know, in fact, one of their
11:38 7 experts uses regression analysis in his own academic work to
11:38 8 evaluate the effect of features on prices.

11:38 9 Q. So for your work in this case, did you build a custom
11:38 10 regression model?

11:38 11 A. I did. I used, you know, standard methods, standard
11:38 12 techniques that are, you know, used by the government to
11:38 13 determine inflation indices. When you hear about the CPI, the
11:38 14 Consumer Price Index, well, that's the type of model that I
11:38 15 used here. So it's widely used.

11:38 16 But of course my goal here is to calculate and determine
11:38 17 the benefits of these particular technologies for Intel's
11:39 18 products. And that's based upon, you know, the confidential
11:39 19 information of Intel's financials and based upon their specific
11:39 20 products. And thus I tailored the regression analysis that I
11:39 21 did specific for this case.

11:39 22 Q. So what type of data do you use in your regression
11:39 23 model for this case?

11:39 24 A. So what I want to do is I want to be able to compare
11:39 25 prices on the one hand to the features and characteristics of

11:39 1 the products on the other hand, so I used two sets of data.

11:39 2 On the left-hand side here, on Slide 30, you'll see that I
11:39 3 used sales data from Intel that includes six and a half million
11:39 4 transactions, sales transactions. These are the actual sales
11:39 5 made for actual products and the actual prices that were paid
11:40 6 for those products where each transaction sometimes has several
11:40 7 thousand units that are sold within an individual transaction,
11:40 8 and I compared those to the features and characteristics of the
11:40 9 products that are sold.

11:40 10 There's a particular website database that Intel maintains
11:40 11 for the public called ARK, A-R-K. And this lists out the
11:40 12 different features and characteristics of each of the products
11:40 13 that they are advertising and promoting to the public. And so
11:40 14 I used those features and characteristics, and I compared them
11:40 15 to the prices using a regression analysis.

11:40 16 Q. And how do you go about determining which features or
11:40 17 factors to include in your regression model?

11:40 18 A. Well, I start with all of the available features and
11:40 19 characteristics that are available on Intel's database, and
11:41 20 then I remove those that have too much missing data.

11:41 21 I remove the factors that are already accounted for by
11:41 22 other factors, that there's, you know, so much overlap that
11:41 23 they aren't adding anything.

11:41 24 And then there's certain variables that just simply are
11:41 25 not relevant or informative, such as whether that product is

11:41 1 still being sold today. Well, that of course doesn't matter
11:41 2 for when it actually had been sold. So that doesn't add any
11:41 3 information for us.

11:41 4 Q. So after going through this detailed analysis to
11:41 5 analyze the features that Intel advertises, what features or
11:41 6 factors did you ultimately include in your model?

11:41 7 A. I have those listed here on Slide 7.32. There, you
11:41 8 know, of course I have clock speed, which is reflected in
11:41 9 Base/Turbo frequency and Max Turbo frequency, but there's over
11:42 10 35 other features that -- and characteristics that I use as
11:42 11 control factors.

11:42 12 I also look at the year in which the product was launched.
11:42 13 I looked at the calendar quarter in which the transaction takes
11:42 14 place, because of course the marketplace evolves and changes
11:42 15 over time and I account for that.

11:42 16 And I also look at different customer categories because
11:42 17 different customers and different sizes and types might get
11:42 18 different types of pricing than others, and so I take that into
11:42 19 account as well.

11:42 20 Q. So, Dr. Sullivan, what are the results of your
11:42 21 regression analysis?

11:42 22 A. Well, associated with each factor is what's called a
11:42 23 coefficient. And here on Slide 7.33 I've listed out all of the
11:42 24 coefficients for all of the different factors.

11:42 25 Now, here there's over 150 different factors and that's

11:43 1 because some of the features actually have multiple factors
11:43 2 associated with them. So it's actually up to 150 factors.

11:43 3 Q. And so what is the coefficient on clock speed?

11:43 4 A. Well, you can see that up here at the top left. I'll
11:43 5 blow that up. So here on Slide 7.34 you can see that the
11:43 6 coefficient for clock speed is 0.764.

11:43 7 This is the key result of the regression, okay? So 0.764,
11:43 8 you know, that's a bit less than one, just a little bit more
11:43 9 than three-fourths. And this is providing the mathematical
11:43 10 relationship between price and clock speed separate and apart
11:43 11 from all of the other features and factors.

11:43 12 Q. So, Dr. Sullivan, what does this result mean?

11:43 13 A. Well, what it means is that if there's a 1 percent
11:44 14 improvement in speed, that that results in a price that is
11:44 15 .764 percent greater. There's a price benefit of .764 percent
11:44 16 for every 1 percent improvement in speed.

11:44 17 So if we had a 2 percent speed improvement, then we would
11:44 18 take two times the .764 percent and that would equal, you know,
11:44 19 about 1.5 percent, 1.53 percent.

11:44 20 Q. And does this price benefit include any other
11:44 21 features that would appear in Intel's products?

11:44 22 A. No. This is specific and unique to clock speed
11:44 23 separate and apart from everything else.

11:44 24 Q. So, Dr. Sullivan, did you perform any analyses to
11:45 25 determine whether your model was actually reliable?

11:45 1 A. Yes. I did. I performed a full collection of
11:45 2 standard tests to determine whether the model is reliable. And
11:45 3 here on Slide 7, I'm just listing a few of those.

11:45 4 So up top you can see that for clock speed the p-value --
11:45 5 and p-value's a probability value on whether or not a factor is
11:45 6 not relevant, and you want it to be as close to zero as
11:45 7 possible. Here it's 0.0000. It's effectively zero, you know,
11:45 8 numerically speaking. And so that means it's highly
11:45 9 significant.

11:45 10 I also have listed out the p-values for all of the control
11:45 11 factor groups, and you can see those are either effectively
11:45 12 zero or very close to zero.

11:46 13 And then I also have listed down here at the bottom the
11:46 14 R^2 . The R^2 range is between zero and one, closer to one is
11:46 15 better. And here the R^2 of the model is 0.9391. And so that's
11:46 16 very good for this model.

11:46 17 And taken in -- all total, what this means is that there's
11:46 18 very high statistical confidence that the estimate on the
11:46 19 coefficient for clock speed, that 0.764, that that is
11:46 20 statistically significant with a high degree of confidence.
11:46 21 And ultimately that just means that as an economist, it's
11:46 22 appropriate to rely upon that.

11:46 23 Q. So based on all of your work building the regression
11:46 24 and all of your analysis that you've explained here, are you
11:46 25 confident in the results you obtained for clock speed?

11:46 1 A. Yes.

11:46 2 Q. Now, have Intel's experts made any arguments about
11:46 3 your regression analysis?

11:47 4 A. Yes. They have set forth a number of different
11:47 5 critiques relating to what they refer to as "unexpected
11:47 6 coefficients." There's a Speed Shift, omitted variable bias
11:47 7 and binning.

11:47 8 Q. So let's start with that first argument, the
11:47 9 unexpected coefficients. Should the coefficients on the
11:47 10 control factors be interpreted as direct effects on price?

11:47 11 A. Not necessarily.

11:47 12 So let's go back and take a look at the full collection of
11:47 13 coefficients. Keep in mind that it's this clock speed that I
11:47 14 focused on, right? That's the important piece. And I made
11:47 15 sure to not include other variables that overlap with that
11:47 16 clock speed that could muddy that estimate.

11:47 17 So let me just give you a couple of examples. So the next
11:47 18 one down here, cores. So I'll blow that up. And you can see
11:48 19 that as the number of cores increases, that the coefficient
11:48 20 increases, and that makes perfect sense. That's great.

11:48 21 However, it's not always that way. So you can see here on
11:48 22 the next slide, I've got the coefficients for product family,
11:48 23 and I've highlighted here the Westmere coefficient of 2.29.
11:48 24 Well, you'll notice that's the largest coefficient among the
11:48 25 different product families, and Westmere's one of the oldest

11:48 1 product families so that might almost seem odd or unexpected.

11:48 2 But keep in mind I also have a factor for launch year,
11:48 3 when this product is launching. And so there's overlap between
11:48 4 those two.

11:48 5 So if you were to only look at the coefficient on Westmere
11:48 6 without thinking about that overlap, you might think that's
11:48 7 unexpected. But irrespective of the overlap on the control
11:49 8 factors, it doesn't affect the clock speed estimate that I have
11:49 9 here.

11:49 10 Q. So the clock speed result has been isolated from all
11:49 11 of these other factors?

11:49 12 A. Exactly. Even though there can be overlap in the
11:49 13 control factors.

11:49 14 Q. So let's turn to that second argument that Intel
11:49 15 raised. Is the Speed Shift feature included in your regression
11:49 16 model?

11:49 17 A. I include Speed Shift through the benefits that Speed
11:49 18 Shift has on clock speed. I do not include a separate factor
11:49 19 for Speed Shift itself, the feature itself. And there's very
11:49 20 good reason for that.

11:49 21 And so I'd like to go back to our car example. Unlike
11:49 22 Dr. Annavaram, I actually enjoy Fords. So here you can think
11:50 23 about, you know, the lightning bolt technology, that improves
11:50 24 fuel efficiency, the miles per gallon, and that affects the
11:50 25 price.

11:50 1 So the proper way to value or evaluate this lightning bolt
11:50 2 technology is through the benefits of that technology, which is
11:50 3 through a fuel efficiency. It would not be appropriate to
11:50 4 include the lightning bolt technology as a separate factor
11:50 5 because of the overlap, right? Because otherwise then some of
11:50 6 the effects are going to go to miles per gallon and some of the
11:50 7 effect is going to go to this feature, and so you're diluting
11:50 8 that effect.

11:50 9 And even worse is that customers care about the benefits
11:50 10 of the feature, not the feature itself. You know, thinking
11:50 11 about the Ford Explorer, it's not just the lightning bolt
11:50 12 technology itself, you know, that has maybe a little lightning
11:51 13 bolt emblem, the feature. It's the benefit, right? It's the
11:51 14 fuel efficiency and thus the savings in fuel costs. It's that
11:51 15 benefit.

11:51 16 And so the same is true here in our case. Because the
11:51 17 patents provide a benefit for clock speed and that clock speed
11:51 18 has an effect on the higher prices. And that's the way the
11:51 19 benefits observe. And if we were to include just Speed Shift
11:51 20 technology as a feature, you know, those words aren't the
11:51 21 benefit and instead that would just dilute the effects.

11:51 22 Q. So in your view it was appropriate to not include
11:51 23 Speed Shift directly as a separate factor in the model?

11:51 24 A. Correct.

11:51 25 Q. So let's turn to Intel's third argument, omitted

11:51 1 variable bias. Did you consider whether you included enough
11:51 2 control factors?

11:51 3 A. Yes. So, you know, there's kind of two issues in
11:51 4 building a regression. One is, you know, do you have too many
11:52 5 factors, and then the other is, you know, do you have enough?

11:52 6 And I already talked about the too many and the overlap
11:52 7 and what is referred to as multicollinearity, but there's
11:52 8 another issue that economists consider, which is omitted
11:52 9 variable bias.

11:52 10 This just means that there's a bias that can occur. And
11:52 11 what's referred to as bias, it's a statistical term for just
11:52 12 saying that the number might not be fully accurate. And if
11:52 13 there's not a sufficient collection of features or factors,
11:52 14 that could create a bias.

11:52 15 Here we know that's not an issue. And that's because the
11:52 16 model reliability results that I showed you earlier, the
11:52 17 p-values, the R^2 and the performance of the model, we know that
11:52 18 omitted variable bias is not an issue.

11:52 19 Q. Now, are you familiar with Intel's damages expert
11:52 20 Dr. Lorin Hitt?

11:53 21 A. Yes.

11:53 22 Q. And have you reviewed Dr. Hitt's work in this case?

11:53 23 A. Yes. I reviewed his report. I also read through the
11:53 24 transcript of his deposition.

11:53 25 Q. And what is your opinion of Dr. Hitt's regression

11:53 1 analyses?

11:53 2 A. Well, a key piece of his work in this case is running
11:53 3 what would be referred to as mini regressions. These are
11:53 4 regressions that are run on just individual products, so small
11:53 5 samples of the data. And there's some problems with this.

11:53 6 First off is that it ends up removing, you know, most of
11:53 7 the data each of these mini regressions moves anywhere between
11:53 8 59.4 percent and 99.8 percent of the data. So we're losing a
11:53 9 lot of data when we do that, we're losing information, we're
11:53 10 reducing reliability of the calculations.

11:53 11 But there's another more fundamental issue here, which is
11:54 12 the importance of including both accused infringing products as
11:54 13 well as non-accused, non-infringing products for the regression
11:54 14 analysis. Because one -- in order to figure out the value of
11:54 15 the technology, one has to be able to draw a comparison between
11:54 16 the products that have it versus those that don't.

11:54 17 Let's go back to the car example and think about the two
11:54 18 Ford Explorers. And if all the Ford Explorers had the
11:54 19 lightning bolt technology, it wouldn't be possible then to
11:54 20 measure the price effects of the technology.

11:54 21 And so, not surprisingly, when Dr. Hitt is performing mini
11:54 22 regressions, he's not able to come up with the appropriate
11:54 23 estimate of what the effect is of having improved clock speed.

11:55 24 Q. So the fourth argument you mentioned was binning.
11:55 25 Dr. Sullivan, what is binning as it relates to Intel's pricing?

11:55 1 A. Binning is a pricing process that Intel uses to put
11:55 2 products into different bins -- think of a bucket -- based upon
11:55 3 the characteristics of that product, and in particular the
11:55 4 performance of that product.

11:55 5 So products with higher performance and better
11:55 6 characteristics are placed into a higher bin, and those bins
11:55 7 then result in higher prices.

11:55 8 And, you know, this is -- you know, this process is one of
11:55 9 the things that demonstrates the relationship, that there is a
11:55 10 relationship between performance and price and improvements in
11:55 11 clock speed and price.

11:55 12 Q. So does your analysis account for binning?

11:55 13 A. Yes. Directly. All of the six and a half million
11:56 14 transactions that I use as part of the regression analysis,
11:56 15 those are all sales that were made after those products had
11:56 16 been put through the binning process.

11:56 17 And so they -- by their very nature, by definition they
11:56 18 include the effects of the binning. They reflect Intel's
11:56 19 actual pricing processes because they are the actual prices.

11:56 20 Q. Now, are you familiar with Dr. Hitt's binning
11:56 21 analysis?

11:56 22 A. I am.

11:56 23 Q. And what is your opinion of Dr. Hitt's binning
11:56 24 analysis?

11:56 25 A. Well, in my view, it is not correct. And in

11:56 1 particular, Dr. Hitt creates his own binning process. It's not
11:56 2 based upon the pricing process that Intel uses. Instead, he
11:56 3 uses his own optimization algorithm which then makes up prices
11:57 4 that aren't the ones that Intel actually received, and thus it
11:57 5 does not reflect the benefits to Intel that they actually
11:57 6 receive from the technology because of those actual prices.

11:57 7 There's also the other issue that it's -- his analysis is
11:57 8 based upon, you know, limited data. It's really for overall
11:57 9 only a couple of years' period of time and so it doesn't
11:57 10 reflect what has happened across time. But the fundamental
11:57 11 issue is it's not the actual data.

11:57 12 You know, and as I've described and the method that I've
11:57 13 employed is using the actual prices. So I can look at the
11:57 14 actual benefits that Intel received.

11:57 15 Q. Thank you, Dr. Sullivan.

11:57 16 And the next area I want to discuss is to go back to your
11:58 17 regression model and talk about how you actually used it to
11:58 18 calculate damages here. But before we do that, I'm hoping that
11:58 19 we can take a break. If that works for everyone.

11:58 20 THE COURT: It does. Ladies and gentlemen, it is right at
11:58 21 noon. If you'll be back by 1:15 and resume -- I'll get started
11:58 22 as close as possible, but it may not be till 1:30 that we
11:58 23 actually resume trial. But if you'll be back at 1:15, that'd
11:58 24 be great. Remembering my instructions not to discuss the case
11:58 25 amongst yourselves, you are dismissed.

11:58 1 THE BAILIFF: All rise.

11:58 2 (Jury exited the courtroom at 11:58.)

11:58 3 THE COURT: Dr. Sullivan, you may step down.

11:58 4 Is this the point you break because you're about to -- I'm
11:59 5 going to suggest that we go to lunch and we meet back here at
11:59 6 1:00 and we'll take up the issues that Mr. Lee raised.

11:59 7 Does that work for you, Mr. Lee?

11:59 8 MR. LEE: It does, Your Honor.

11:59 9 THE COURT: And counsel?

11:59 10 MS. PROCTOR: Yes. Thank you, Your Honor.

11:59 11 THE COURT: We'll see you in about an hour.

12:05 12 (Recess taken from 11:59 to 1:17.)

01:17 13 THE BAILIFF: All rise.

01:17 14 THE COURT: Thank you. You may be seated.

01:17 15 I think Mr. Chu is sending me a subliminal message here.

01:17 16 MR. CHU: No, no. Not at all, Your Honor. We're very
01:17 17 well protected by the Court from COVID but not the common cold
01:17 18 this morning.

01:17 19 THE COURT: If Dr. Sullivan would take the stand, and if
01:17 20 you would tell me the questions that you're seeking to get from
01:17 21 him, and also where in his report that information is shown,
01:17 22 that would be great.

01:17 23 And, Mr. Lee, then I'll give you an opportunity.

01:17 24 MS. PROCTOR: Absolutely, Your Honor.

01:18 25 So if we could pull up the slides. And I'll just show you

01:18 1 the slides we have, Your Honor. And I actually just sent a
01:18 2 couple of revised slides to Intel, so they have them, a couple
01:18 3 of updated ones that we may add based on your guidance.

01:18 4 THE COURT: Okay.

01:18 5 MS. PROCTOR: So if we can look at the next slide. This
01:18 6 is the -- we want to show basically two per-unit calculations.
01:18 7 And let me take a step back. What we really want to do is we
01:18 8 want to show this calculation two ways.

01:18 9 So if you'll go ahead to Slide 49.

01:18 10 So this is the calculation that is in his report exactly
01:18 11 like this in one of the attachments. We can look at if you'd
01:18 12 like -- it's D -- let's see. It's -- well, it's Plaintiff's
01:19 13 Exhibit 3910.

01:19 14 So this is the calculation that's in the report. He walks
01:19 15 through these numbers, he does this math, and he actually has
01:19 16 an attachment that just shows exactly these numbers and this
01:19 17 result.

01:19 18 Now, what we also want to show is the per-unit
01:19 19 calculation.

01:19 20 And if we can go back two slides.

01:19 21 I want to ask him to walk through this at a per-unit
01:19 22 level. And, Your Honor, these are the exact same numbers, so
01:19 23 this infringing revenue per unit is literally just the accused
01:19 24 revenues which are in the report in multiple places.

01:19 25 I can give you a pincite if you'd like.

01:19 1 They are in his attachments. He has an attachment that
01:19 2 just calculates accused revenues per patent. We just take the
01:19 3 accused revenues and divide by number of units. So this is
01:19 4 total revenue per unit. It is one calculation just doing that
01:19 5 division. And we're doing the exact same math that he shows in
01:19 6 his report but showing it at a per-unit level.

01:20 7 And so this is -- these are all numbers that were
01:20 8 disclosed to them. It is absolutely material that they had
01:20 9 available to them and that they understood.

01:20 10 And I want to address Mr. Lee's point about how this
01:20 11 supposedly prejudiced Intel, that this is somehow a surprise.
01:20 12 So this just simply is not a surprise. They've had all of
01:20 13 these numbers.

01:20 14 They actually objected, Your Honor, to a couple of other
01:20 15 calculations we did where we took two numbers, one for each
01:20 16 patent, and added them. And they said that was unfair because
01:20 17 it wasn't in the report. And they've since withdrawn those
01:20 18 objections, because we all agree either party here can add two
01:20 19 numbers together. That's what we need to do to explain our
01:20 20 case to the jury.

01:20 21 And here we have the exact same situation. In order to
01:20 22 explain our case to the jury and show how this works, and to
01:20 23 avoid actually Intel's objection that showing the total accused
01:20 24 revenues somehow creates an appeal issue, to avoid that issue,
01:20 25 this is what we would do --

01:20 1 THE COURT: And that appeal issue being the stacking
01:21 2 issue?

01:21 3 MS. PROCTOR: No. I'm sorry. They have an objection
01:21 4 under the entire market value rule.

01:21 5 THE COURT: Okay.

01:21 6 MS. PROCTOR: And they say that showing that \$50 billion
01:21 7 total accused revenue or \$123 billion total accused revenue
01:21 8 will somehow skew the damages horizon for the jury in a way
01:21 9 that will prejudice them. And so they're preserving that
01:21 10 argument for appeal.

01:21 11 So we want to, in response to that, to basically
01:21 12 accommodate their request, let's take that big number they
01:21 13 don't like. Let's divide it by the number of units, and let's
01:21 14 explain it to the jury that way.

01:21 15 So it's the exact same calculation. The 5.45 is there,
01:21 16 the .764 is there. We've just divided revenues by units and
01:21 17 that gets you this additional revenue per unit.

01:21 18 The report is very clear that Dr. Sullivan is seeking a
01:21 19 running royalty and that that royalty should reflect the extent
01:21 20 of use, and it should reflect the number of units.

01:21 21 And they deposed Dr. Sullivan about this. He was clear in
01:21 22 his deposition that the -- his damages number would be higher
01:22 23 if there were more units that infringe and lower if there were
01:22 24 fewer, right? We all agree his damages have always been
01:22 25 proportional to the number of units. There's a direct

01:22 1 connection there.

01:22 2 And so, again, I just don't understand how this is a
01:22 3 surprise. We actually deposed their witnesses on this royalty
01:22 4 stacking issue. And their 30(b)(6) witnesses on licensing said
01:22 5 simply: We do not track royalties on a per-unit basis. We do
01:22 6 not have any data on any royalty burden on our products.

01:22 7 So, Your Honor, if they thought it would help them to do
01:22 8 this division and make a royalty stacking argument, you would
01:22 9 have already heard about it. This is really just a very
01:22 10 straightforward way to demonstrate, to explain, to show the
01:22 11 jury what we've done in a way that tries to avoid one of their
01:22 12 concerns and tries to at least mitigate this potential appeal
01:23 13 issue by spending less time.

01:23 14 Our goal is to spend less time showing, looking at,
01:23 15 talking about the big numbers.

01:23 16 THE COURT: Okay.

01:23 17 MS. PROCTOR: And just one other small point.

01:23 18 If we can go ahead I think three slides. Let's see if
01:23 19 that gets us there.

01:23 20 So I've added now after we do the calculation at the total
01:23 21 revenue level that was in his report that they object to only
01:23 22 because the numbers are too big, Your Honor mentioned that
01:23 23 perhaps we could, after we show the calculation of something
01:23 24 like the 2.1 billion, which is all apportioned, we could maybe
01:23 25 then just say, Dr. Sullivan, if you divide that by number of

01:23 1 units, what would you get?

01:23 2 So this is another slide that we just added. We've sent
01:23 3 it to the other side. And it's another option where we can
01:23 4 show it.

01:23 5 But our view is that we need to be able to show these
01:23 6 numbers to prove up our case. These are how we -- this is how
01:23 7 we calculated damages. We've just done nothing but this small
01:23 8 tweak to address, actually, one of Intel's concerns about the
01:24 9 magnitude of the numbers.

01:24 10 THE COURT: Got it.

01:24 11 Mr. Lee?

01:24 12 MR. LEE: Your Honor, this is not a small tweak.

01:24 13 If I could have the slide that -- it's PDX-7.49. Let me
01:24 14 make sure we've got the right one. Let's use PDX-7.52.

01:24 15 I think this is one she said was the way it was presented
01:24 16 in his report. And he did present an analysis that was based
01:24 17 upon his analysis times infringing revenues for the units.

01:25 18 But in his report, Your Honor, and in his deposition, he
01:25 19 said he could present his analysis and ultimate opinion without
01:25 20 having to disclose the total number of all the accused
01:25 21 products.

01:25 22 And if I could hand up to you Page 143 of his deposition
01:25 23 transcript and Page 123 of his opening report. I'll give
01:25 24 copies to Ms. Proctor.

01:25 25 So, Your Honor, the lay of the land until this morning, or

01:25 1 until last night, was they were presenting his analysis. It
01:25 2 was based upon the total infringing revenues, which as
01:25 3 Ms. Proctor says was the analysis he presented in his report.
01:25 4 And he said he could present that analysis without disclosing
01:26 5 the total infringing revenues.

01:26 6 That is fine with us because, well, we disagree with it,
01:26 7 but it's fine with us for him to present it, because that's
01:26 8 what's in his report. That's the analysis in his report. And
01:26 9 you'll see in the footnote in his report he himself says he can
01:26 10 present it without disclosing the total revenues. And then we
01:26 11 asked him that question and he said it would be reasonable to
01:26 12 do so.

01:26 13 So all we're asking is that he do what he said in his
01:26 14 report and his deposition.

01:26 15 You will not find in the report anywhere this per-unit
01:26 16 calculation. And it's not just a tweak, Your Honor, and it's
01:26 17 not just math. Because if I go to their later slides --

01:26 18 If I could -- just give me a second, Your Honor.

01:26 19 They translate this into a per-unit royalty later in their
01:27 20 slides. This is a different type of royalty. It's not just
01:27 21 math. It would have different implications for the case. We
01:27 22 would have responded to it differently, and so it's just a new
01:27 23 theory.

01:27 24 And we have no objection to him pursuing the theory that
01:27 25 he pursued before.

01:27 1 Yes, Your Honor. If I could ask Mr. Lee to bring up, for
01:27 2 instance, Slide No. 7.47, where he computes an additional
01:27 3 revenue per unit. Then they take that additional revenue per
01:27 4 unit, they reduce it, and they come up with what they call a
01:27 5 per-unit royalty. A per-unit royalty is different. We would
01:28 6 have responded to it differently. It's not in the expert
01:28 7 report.

01:28 8 So all we're asking is that they be held to what they
01:28 9 represented before. He has an analysis that is power savings
01:28 10 times price benefit times total revenues of the accused
01:28 11 products. He said he could present that, as Your Honor sees,
01:28 12 without disclosing the total accused revenues. And we think
01:28 13 that that is the way to go.

01:28 14 Now, that would require some adjustments to these charts,
01:28 15 because there's like -- there's three different ways of
01:28 16 presenting it in these charts. Half of them should go out
01:28 17 because they're on a per-unit basis, which was never the basis
01:28 18 for what he disclosed. And it would be prejudicial and unfair,
01:28 19 and honestly, Your Honor, we would have responded to it had we
01:28 20 had the chance.

01:28 21 On the others, he can present it, but he doesn't need
01:28 22 the -- if we hold him to his word, he doesn't need the total
01:28 23 revenues in the record or to say them. He can just describe
01:28 24 what he does, and he can come up with the number that is his
01:29 25 number.

01:29 1 THE COURT: Okay. Yes, ma'am.

01:29 2 MS. PROCTOR: So, Your Honor, turning to the deposition
01:29 3 excerpt that Mr. Lee just provided to you and the portion of
01:29 4 his report, what Dr. Sullivan was saying that it -- was that if
01:29 5 Intel had won its motion in limine where they asked you to
01:29 6 exclude the accused revenues, would it be possible for him to
01:29 7 do the same calculation with a black box there instead of a
01:29 8 number? Sure. We could present it that way, but this is --
01:29 9 that is highly confusing to the jury, and there's no basis for
01:29 10 Intel's trial team here to dictate how Dr. Sullivan presents
01:29 11 his analysis.

01:29 12 So I'm not sure how the bit that you just got from Mr. Lee
01:29 13 really relates to this dispute, because what Dr. Sullivan was
01:29 14 saying is that, yes. He could basically not show the math.

01:30 15 THE COURT: Mr. Lee, I'll tell you that's the way I read
01:30 16 this as well. The prior -- the -- I mean, I only have this
01:30 17 page, but it reads now -- the answer was, "Now, it could be
01:30 18 that the Court deems it appropriate to disclose that data
01:30 19 information to the jury and perhaps not."

01:30 20 And Mr. Hirsch says, "I think I understand."

01:30 21 Then he asks this question and he says, "In my view,
01:30 22 that's reasonable."

01:30 23 But I don't see that as him saying he's not going to do
01:30 24 it. I see it as kind of an alternative statement.

01:30 25 With respect to his report, I'm looking at the footnotes

01:30 1 and especially the ones you've highlighted. One says, "The
01:30 2 determination for the reasonable royalties herein does not
01:30 3 require disclosure of accused sales or the effective percentage
01:30 4 royalty rate as the determination of reasonable royalties as
01:31 5 based upon a portion of revenue that's specifically attributed
01:31 6 to the patented technology."

01:31 7 And it sounds to me like that's what he's about to do
01:31 8 and -- which I'm okay with.

01:31 9 And then he says, "The determination of reasonable
01:31 10 royalties herein does not require disclosure of accused sales
01:31 11 or the effective percentage royalty rate as the determination
01:31 12 of reasonable royalties based upon a portion of revenues that
01:31 13 is specifically attributable," but it sounds to me like that's
01:31 14 what he's going to be asked to do here as well.

01:31 15 Power savings times the price benefit times the infringing
01:31 16 revenue per unit is what he is doing in terms of apportioning
01:31 17 the revenue specifically attributable to the patented
01:31 18 technology. What am I missing?

01:31 19 MS. PROCTOR: That's exactly right, Your Honor. One
01:31 20 moment.

01:31 21 MR. LEE: So, Your Honor, there are two separate issues.

01:32 22 THE COURT: Okay.

01:32 23 MR. LEE: Okay. The first is one you just identified.
01:32 24 And, you know, all I can say is we would disagree. I think
01:32 25 that Uniloc would say, no. He shouldn't be able to do that,

01:32 1 and Ericsson would also say that. But we've made our position
01:32 2 clear to Your Honor. If that's your ruling, we understand it.

01:32 3 If I could have on the screen though PDX-7.63. And
01:32 4 then -- and maybe the next. This is different. This is --

01:32 5 THE COURT: Just to protect your record, if you can make
01:32 6 sure you state on the record what it is I'm looking at.

01:32 7 MR. LEE: Yes. It's PDX-7.64, and I think I have the
01:32 8 numbers right because we don't have the newest set. But for
01:32 9 the set I have right now it's PDX-7.64, Your Honor.

01:32 10 This reasonable royalty per unit number is a new number.
01:32 11 It's not in the reports anywhere.

01:33 12 THE COURT: Okay.

01:33 13 MR. LEE: How does that come in?

01:33 14 MS. PROCTOR: So, Your Honor, this is exactly what you
01:33 15 contemplated when Mr. Lee first raised this this morning.

01:33 16 This is our total damages award. If you divide it by the
01:33 17 number of units, this is what you get. And we're just showing
01:33 18 that you can also calculate it at a per-unit level, just like
01:33 19 we just showed. This is just the next step.

01:33 20 So Your Honor just described his analysis quite well,
01:33 21 saying that we start by apportioning the revenue down to just
01:33 22 the patented benefit. Then there's another step where we look
01:33 23 at each party's contribution and award the royalty just based
01:33 24 on Freescale's contribution.

01:33 25 And so that's what we're doing here. We're starting with

01:33 1 that incremental -- just the additional revenue attributable to
01:33 2 the patent multiplying it by the contribution that Freescale
01:33 3 made and that's how we get to the reasonable royalty.

01:33 4 The report has this exact calculation except instead of
01:33 5 dividing the first number and the last number by the units, we
01:33 6 have the undivided numbers that Intel objects to as being too
01:34 7 large.

01:34 8 THE COURT: Mr. Lee, I am concerned that you're trying to
01:34 9 have it both ways. If -- you're making the one objection that
01:34 10 you're making, and they are trying to address this, and as long
01:34 11 as those -- and let me make sure I'm clear, where it says
01:34 12 "additional revenue per unit of 5.50," was that in his report?

01:34 13 MS. PROCTOR: The additional revenue attributable to all
01:34 14 the accused products in his report divided by the number --

01:34 15 THE COURT: -- by the number of units.

01:34 16 MS. PROCTOR: -- which is also in his report.

01:34 17 THE COURT: So really what you -- all this has done is
01:34 18 taken the math of the additional revenue against the number of
01:34 19 units, which I assume was in the report as well?

01:34 20 MS. PROCTOR: Absolutely.

01:34 21 THE COURT: And so it's taken that, and it's -- and by
01:34 22 doing that, it said it's additional revenue per unit -- that
01:35 23 math equals \$5.50.

01:35 24 MS. PROCTOR: Exactly.

01:35 25 THE COURT: And then with respect to the Freescale

01:35 1 contribution, is that number in his report as well?

01:35 2 MS. PROCTOR: Yes. That exact calculation with that
01:35 3 percentage just without the division by the number of units
01:35 4 that you just described.

01:35 5 THE COURT: Mr. Lee, anything else?

01:35 6 MR. LEE: Your Honor, everything captured in Ms. Proctor's
01:35 7 statement is they just go on in the next step, and there are
01:35 8 two separate issues without a doubt.

01:35 9 We understand that if Your Honor's ruling, that the total
01:35 10 revenues can come in, then that set of slides is his analysis.
01:35 11 That's in his report. And subject to what we've said about
01:35 12 Uniloc, that should come in because that's in his report.

01:35 13 A -- doing the next step and restating the damages number
01:35 14 as a per-unit royalty is a different damages analysis. We
01:35 15 would have responded to it differently. We would have had a
01:36 16 royalty stacking argument at a minimum. Our experts would have
01:36 17 computed reasonable royalties per unit on comparable licenses.
01:36 18 It would have been a different defense.

01:36 19 So you are right. It's -- we're not -- I don't think
01:36 20 we're trying to have it both ways. We understand that if Your
01:36 21 Honor rules total revenues are on the slide because that's what
01:36 22 he's done, that's where we are and we'll deal with it.

01:36 23 This is a different damages presentation, and I think the
01:36 24 one thing we both agree upon is this 4.19 per unit for the '373
01:36 25 patent is nowhere in his report.

01:36 1 THE COURT: You faded out. I just couldn't hear you.

01:36 2 MR. LEE: I'm sorry. The \$4.19 per unit is nowhere in his
01:36 3 report.

01:36 4 THE COURT: So as I understand it -- and jump in here if I
01:36 5 don't, I'm doing my best -- the additional revenues per unit
01:36 6 number of \$5.50 comes from his methodology, breaking it down by
01:37 7 the number of units that are accused in this case, correct?

01:37 8 MS. PROCTOR: Yes.

01:37 9 MR. LEE: That's what we understand. This is, as I said,
01:37 10 new. So we had to confirm it.

01:37 11 THE COURT: The \$5.50 is new?

01:37 12 MR. LEE: The math to get there, but I don't have any
01:37 13 reason to believe that that's not an accurate -- it's not an
01:37 14 accurate mathematical calculation.

01:37 15 THE COURT: It's not an inaccurate?

01:37 16 MR. LEE: Yeah. I have no reason to believe it's
01:37 17 inaccurate.

01:37 18 THE COURT: And so I must be having a hard day of hearing
01:37 19 you. I'm sorry.

01:37 20 And -- but the number of units is in his report or a
01:37 21 number that maybe it had gotten -- made more current, but what
01:37 22 he did in his report was said, there's a number of units, and
01:37 23 in his report there is the whole number that, if divided by the
01:37 24 number of units, would have \$5.50, correct? That is in his
01:38 25 report.

01:38 1 MR. LEE: Yes.

01:38 2 THE COURT: Okay. And then the Freescale -- the concept
01:38 3 of a Freescale contribution of 76.2 percent is in his report,
01:38 4 correct?

01:38 5 MR. LEE: Yes.

01:38 6 THE COURT: Okay. So as odd as this may seem, I
01:38 7 understand Intel's concern with saying what a reasonable
01:38 8 royalty is per unit, and I'm not going to allow VLSI to do that
01:38 9 math. But I am okay with the slide other than the equals part.

01:38 10 In other words, if Dr. Sullivan wants to say the total
01:38 11 number and explain that math, that is a way. There's an
01:38 12 additional revenue per unit times Freescale contribution winds
01:38 13 up for the total number of units with the total number, I would
01:39 14 be okay with that.

01:39 15 MR. LEE: Your Honor, one other thing for Dr. Sullivan.
01:39 16 Could I have the slide --

01:39 17 MS. PROCTOR: So before we move on.

01:39 18 MR. LEE: Oh, go ahead. I'm sorry. I apologize.

01:39 19 MS. PROCTOR: So, Your Honor, I think the concern you may
01:39 20 have is what Mr. Lee voiced at the very end there about calling
01:39 21 this is a "royalty per unit."

01:39 22 THE COURT: Correct.

01:39 23 MS. PROCTOR: What if we just call it "effective rate per
01:39 24 unit" or something else because the math is very clear. The
01:39 25 jury can do this. If that's the concern, we can reframe it

01:39 1 slightly so that we're not saying it's a per-unit royalty.

01:39 2 We're just saying, here's the math, here's the calculation at a
01:39 3 per-unit level.

01:39 4 THE COURT: Mr. Lee?

01:39 5 MR. LEE: We would object. There's -- there's a reason
01:39 6 that the damages claim was not stated on a royalty per-unit
01:39 7 basis. We responded to the damages claim knowing that it
01:39 8 wasn't offered on that basis. And halfway through the trial,
01:40 9 it would be very prejudicial to have the playing field shift.

01:40 10 I think he should give the opinion -- the number
01:40 11 ultimately. The large number isn't the same, but how he gets
01:40 12 there is important. And I think trying to backdoor in an
01:40 13 effective royalty rate/effective unit rate is -- we would have
01:40 14 responded differently, Your Honor.

01:40 15 MS. PROCTOR: Your Honor, they have very --

01:40 16 THE COURT: Well, Mr. Lee, didn't he get to his whole
01:40 17 number by doing the reverse math, which is whatever his number
01:40 18 is was gotten to by the revenue per unit times the number of
01:40 19 units, so the big number he's going to start from in terms of
01:40 20 the additional revenue that he's going to argue was generated
01:40 21 is in his report, right?

01:40 22 MR. LEE: Your Honor, without a doubt there is -- the
01:40 23 numbers that he's using to make these computations were in his
01:41 24 report in some form.

01:41 25 My concern -- setting aside the first concern, which I

01:41 1 understand Your Honor has ruled on and we'll address in
01:41 2 cross -- we don't want a per-unit royalty, which is a different
01:41 3 analysis that he undertook, to come in the back door.

01:41 4 And I think he can present what he's going to present in
01:41 5 exactly the way he presented in his report. But there
01:41 6 shouldn't be even an effective royalty rate or an effective
01:41 7 rate. That's just another way to get the different -- it's --
01:41 8 it gets to the same ultimate number, as Your Honor has
01:41 9 suggested, but it is analytically different and would have had
01:41 10 a different response from us.

01:41 11 THE COURT: Counsel, anything else?

01:41 12 MS. PROCTOR: So I just don't agree that it's analytically
01:41 13 different. These are the numbers. These are the calculations
01:41 14 we did. We're just dividing by the number of units. Like I
01:41 15 said, I think a very slight tweak to the wording here would
01:42 16 address Mr. Lee's concern.

01:42 17 Also Your Honor suggested that perhaps after he does the
01:42 18 calculation, he could go back and we could just say, now, if
01:42 19 you divide by the number of units, what would you get as just
01:42 20 on a per-unit basis? And so we've added a slide showing
01:42 21 that -- if we can advance one, let's try one forward. One
01:42 22 more. One more. There we go.

01:42 23 Sorry, this is the new slide.

01:42 24 But where we just show, here's the royalty he calculated,
01:42 25 divide by the number of units. These are both very clearly

01:42 1 numbers in his report, and we could call it an "effective rate
01:42 2 per unit" or something like that.

01:42 3 There's really no dispute that this is his methodology.
01:42 4 These are the numbers he used. He described it as a running
01:42 5 royalty tied to the extent of use in his report. This is --

01:42 6 THE COURT: I guess, here's the question: Is -- in his
01:42 7 report anywhere, did he suggest that the way he got to the
01:42 8 reasonable royalty of 1,611,000,000 -- actually, yes,
01:43 9 1,611,609,964, is there anywhere in his report that indicates
01:43 10 that that was gotten to by the use of multiplying the number of
01:43 11 units times some other number?

01:43 12 MS. PROCTOR: So the way he did it in his report was by
01:43 13 looking at the overall effect across the units. So calculating
01:43 14 it at the level of total revenues, total additional revenues.
01:43 15 So he did not do the per-unit calculation in his report, but I
01:43 16 think it is important. This is just a presentation issue, and
01:43 17 it is important for us to be able to present our case to the
01:43 18 jury in a way they can understand.

01:43 19 THE COURT: Well, no. I mean, I think if he did not
01:43 20 involve the infringing units to get to the reasonable
01:43 21 royalties, that's my concern.

01:43 22 MS. PROCTOR: Yeah. So let me clarify. He absolutely
01:43 23 did, and the calculations are absolutely tied to the number of
01:43 24 units in the sense that if you add one unit, the number would
01:44 25 go up, the total number. If you take one away -- these are

01:44 1 very clearly proportional.

01:44 2 And it goes back to what Your Honor was saying a moment
01:44 3 ago, this whole analysis is tied to the idea that in every
01:44 4 single infringing chip, it's getting that extra power savings
01:44 5 or that extra speed increase. So it's a per-chip benefit.

01:44 6 THE COURT: I just want to know if there's anything in his
01:44 7 report that gave Intel notice that they might be facing
01:44 8 testimony here today that the effective royalty rate is \$4.19.

01:44 9 MS. PROCTOR: Yeah. So these numbers are there. The
01:44 10 reasonable royalty's there, the infringing units are there.
01:44 11 The \$4.19, we didn't calculate that exact number in the report,
01:44 12 but these inputs are there. This is just the same as adding
01:44 13 two numbers together. We're just showing it to the jury on a
01:44 14 per-unit basis.

01:44 15 And I think his running royalty section is quite clear.
01:44 16 He says over and over again, "This royalty has to be tied to
01:44 17 number of units Intel is selling. It has to be tied to the
01:44 18 extent of use. It has to be directly linked to the actual
01:45 19 sales Intel is making, both on a revenue basis and on a
01:45 20 per-unit basis."

01:45 21 So if you're asking what --

01:45 22 (Conference between the Court and law clerk.)

01:46 23 THE COURT: Anything else you'd like to add?

01:46 24 MS. PROCTOR: Your Honor, were you looking at the royalty
01:46 25 structure section of the report? Or would you like to? That's

01:46 1 the part I was referring to. It's Section 9.1.

01:46 2 MR. CHU: If I may, Your Honor.

01:46 3 THE COURT: I don't know that I have Section -- I don't
01:46 4 know if I do or don't have it. I've got Pages 123 and 124 of
01:46 5 his report.

01:46 6 MS. PROCTOR: So, okay. So can we pull up Page 52 of
01:46 7 Dr. Sullivan's report in this case?

01:47 8 MR. CHU: While we're doing that, Your Honor, the word
01:47 9 "math" has been used. It's not that fancy. This is
01:47 10 arithmetic.

01:47 11 Mr. Lee argues, oh, they're terribly surprised. They
01:47 12 would have prepared their case differently. They would have
01:47 13 done arithmetic for the lump sum royalties that they want to
01:47 14 rely upon.

01:47 15 So let's say there's an agreement that's 2 million,
01:47 16 3 million, 4 million. They take the same number of units, do
01:47 17 the calculation -- or we could do the calculation and say it's
01:47 18 \$0.02 per unit. It makes it understandable for a jury.

01:47 19 THE COURT: Well, I have --

01:47 20 MR. CHU: It's just arithmetic.

01:47 21 THE COURT: I have to tell you I could see an argument
01:47 22 from Intel where they would come in and say, ladies and
01:47 23 gentlemen, this number that Sullivan is giving you is
01:47 24 ridiculous. That works out to be -- if you do the math, works
01:47 25 out to be X, you know, number of dollars per unit by just doing

01:48 1 the math, so I understand your point.

01:48 2 MR. CHU: Right. But if we had just done it on a per-unit
01:48 3 and didn't have the total, they would have done the
01:48 4 multiplication. This is just doing the division. Everyone
01:48 5 here passed arithmetic.

01:48 6 MS. PROCTOR: So there's just one point I want to -- one
01:48 7 little part I want to point to in here.

01:48 8 THE COURT: Okay.

01:48 9 MS. PROCTOR: All right. Can I just read you one
01:48 10 sentence, Your Honor?

01:48 11 THE COURT: Yes, ma'am.

01:48 12 MS. PROCTOR: Probably easiest at this point.

01:48 13 "The benefits, i.e., revenues and profits that Intel
01:48 14 receives from using the technology increase as sales of the
01:48 15 accused products increase. Thus a royalty" -- two sentences --
01:49 16 "Thus a royalty that is directly related to sales measures the
01:49 17 actual value gained by Intel through its use of the
01:49 18 technology."

01:49 19 This is not a new theory. Our theory was very clear. Our
01:49 20 royalty is tied to Intel's actual sales in terms of revenue and
01:49 21 units. And this simple calculation, simple arithmetic is just
01:49 22 a presentation issue to help the jury understand our damages
01:49 23 case.

01:49 24 THE COURT: Mr. Lee?

01:49 25 MR. LEE: Two things, Your Honor. One is that number,

01:49 1 that reasonable royalty number is not in the reports anywhere.

01:49 2 I think we both agree upon that now.

01:49 3 The second is, it's not simple arithmetic, at least not to
01:49 4 me. In order to respond, as Mr. Chu said, we would have to
01:49 5 take these comparable licenses that we have identified, both
01:49 6 for these patents and other patents.

01:50 7 We would then have had to identify the number of units
01:50 8 that were covered by those licenses. And it's going to vary
01:50 9 and different, something that we didn't do, and then we'd have
01:50 10 to compute this effective reasonable royalty rate which we
01:50 11 haven't done.

01:50 12 There are purchases of these patents. There are licenses
01:50 13 between Intel and Freescale. There are other Intel licenses.
01:50 14 And some of them cover the same universe of products; some of
01:50 15 them don't. And so the idea that you can just do math to
01:50 16 figure out the effective royalty rate of these license
01:50 17 agreements is simply not true.

01:50 18 And the best indication, Your Honor, that we didn't think
01:50 19 this was coming is what Mr. Chu suggested that we do, we
01:50 20 haven't done. And I'm not sure for some of the agreements that
01:50 21 we have enough information to do it.

01:50 22 MR. CHU: They use lump sums either --

01:51 23 THE COURT: If you'll take your mask off, I can hear you
01:51 24 better. Thank you.

01:51 25 MR. CHU: Oh. Thank you, Your Honor.

01:51 1 They use lump sums, either a purchase price or lump sum
01:51 2 licenses. They don't want to do a per-unit royalty because it
01:51 3 will seem infinitesimally small. And, therefore, they make it
01:51 4 extremely difficult.

01:51 5 They knew by having two numbers which were always in
01:51 6 Dr. Sullivan's report, the total number of units and the total
01:51 7 amount of damages. That was very clear. They always had those
01:51 8 numbers.

01:51 9 The fact that Dr. Sullivan didn't expressly say, I take
01:51 10 one number, I divide by the number of units, here's what it is
01:51 11 per unit.

01:51 12 What they're trying to do is not only dictate what
01:51 13 Dr. Sullivan says, they're trying to dictate what I can say in
01:52 14 closing argument.

01:52 15 How could it be that I couldn't get up and say: Here's
01:52 16 the total amount of damages. Here's what it ends up being on a
01:52 17 per-unit basis? I can't imagine that that would be supported
01:52 18 in law, that one would be barred from doing that simple
01:52 19 arithmetic.

01:52 20 They make arguments with respect to their license
01:52 21 agreements that have to do with, well, there were more patents
01:52 22 that were licensed or more patents that were sold and things
01:52 23 like that. That's fair game. They're entitled to put forward
01:52 24 their case on damages. I think we are as well.

01:52 25 They had notice of the basic numbers and the basic

01:52 1 theories, as well as the way in which there were allocations
01:52 2 down, the percentages and the like.

01:52 3 But the final number that they're complaining about is
01:52 4 just the total which was there, the total number of units which
01:52 5 was there which came from them, and that's it. And it's a
01:53 6 much -- there's obviously much more detailed analysis in
01:53 7 Dr. Sullivan's report. And they can cross-examine him about
01:53 8 it.

01:53 9 THE COURT: Mr. Lee, anything else?

01:53 10 MR. LEE: Your Honor, the comparable license agreement
01:53 11 offer involved different patents, different number of patents,
01:53 12 different products, different periods of time. If we had been
01:53 13 asked to respond to a reasonable royalty rate on a per-unit
01:53 14 basis, there would have been a different analysis. We can't do
01:53 15 that now.

01:53 16 What they're asking you to do in the guise of a tweak is
01:53 17 to allow them to present an additional theory that we won't
01:53 18 have a chance to respond to. We couldn't even respond to it by
01:53 19 the time our damages person testifies, because I couldn't
01:53 20 generate the information. This is not just two plus two equals
01:53 21 four. It's a much more complicated analysis.

01:54 22 We don't disagree for a second, given Your Honor's ruling
01:54 23 on the total revenues of the accused products. He should be
01:54 24 able to present what's in his 123-page report, and we'll
01:54 25 cross-examine on it.

01:54 1 But numbers that are not in the report, it should not be
01:54 2 presented. And particularly if those numbers embody a new
01:54 3 theory, and a per-unit royalty is a new theory.

01:54 4 THE COURT: Well, here's where I see it headed.

01:54 5 Mr. Lee, your concern is -- in part, your concern is that
01:54 6 Dr. Sullivan indicates that he came up with a per-unit royalty,
01:54 7 which I think we've established he did not.

01:54 8 I mean, that wasn't his methodology. He didn't come up
01:54 9 and say, I'm going to have a per-unit royalty. It's X number
01:54 10 of dollars -- X number of units were sold so the total is X
01:54 11 times Y equals Z. It's Z.

01:55 12 What I'm having a much harder time preventing Dr. Sullivan
01:55 13 from doing is, if he were to be asked, you've given the jury
01:55 14 the number of 1 point whatever. And the number of units that
01:55 15 were sold, as it turns out, was this.

01:55 16 What does that wind up being per unit? To me, that is
01:55 17 just math. That is not -- he didn't use it as a methodology.
01:55 18 It just -- it is doing the math for the jury so they
01:55 19 understand.

01:55 20 And I don't -- and part of me says if I were Intel, I
01:55 21 might want them to hear that and say that's too much per unit.

01:55 22 MR. LEE: Your Honor, I'm not sure I have anything to add
01:55 23 that I haven't said before, and I don't want to be redundant.
01:55 24 I guess if that's Your Honor's ruling, you'll preserve our
01:55 25 objection. If --

01:56 1 THE COURT: Well, I'm just saying that I get that -- and I
01:56 2 would not permit Dr. Sullivan to say, I used a methodology of a
01:56 3 per-unit royalty to get to a total amount. He didn't do that.

01:56 4 But I don't understand -- I'm just -- I can't get my arms
01:56 5 around how he can't just perform the role of a human calculator
01:56 6 to say: I've given you the total number. I've given you what
01:56 7 I think the total -- I came up with a total number. And here's
01:56 8 how I did it. And that's within the boundaries of his report.

01:56 9 MR. LEE: Right.

01:56 10 THE COURT: And it turns out Intel sold X number of units.
01:56 11 And so that winds up being, if you divide those two things, Z.
01:56 12 That is just what is. I mean, any juror could do that.

01:57 13 MR. LEE: I don't disagree. The slide I'm objecting to is
01:57 14 the one where he characterized it as a reasonable royalty per
01:57 15 unit.

01:57 16 THE COURT: No, they're not going to use that. And I
01:57 17 think I've made clear -- and again, will say it for the
01:57 18 seventieth time, you're preserving your error, that you don't
01:57 19 think I'm doing the right thing to begin with, so --

01:57 20 MR. LEE: No, no, no. There are many right things, I just
01:57 21 disagree with a few.

01:57 22 THE COURT: That's fine. But so I'm not tampering with
01:57 23 that.

01:57 24 MR. LEE: Sure.

01:57 25 THE COURT: But what I will allow the plaintiff to do is

01:57 1 to be what I would call a human calculator.

01:57 2 MR. LEE: Fine.

01:57 3 THE COURT: If he does his entire methodology and has a
01:57 4 number, and he has -- and it gets into evidence, which it will,
01:57 5 whatever the most accurate -- whatever number -- I know there
01:57 6 may be some slippage between numbers of sales, you know,
01:57 7 between report and whatever the trial is. But whatever you all
01:57 8 have agreed is the number of units that's involved, if he says
01:58 9 that. And if the plaintiff wants to turn him into a human
01:58 10 calculator to say, that winds up being whatever the number is
01:58 11 per -- you know, per unit, that's okay.

01:58 12 MR. LEE: All right.

01:58 13 THE COURT: He cannot intimate that he used a per-unit
01:58 14 royalty as a coefficient to get the correct number.

01:58 15 MR. LEE: Fair enough. Could I -- I know the jury's
01:58 16 waiting. Could I raise one more point --

01:58 17 THE COURT: Of course.

01:58 18 MR. LEE: -- where I may have misspoke this morning? I
01:58 19 said that I didn't think the Fortress issue would come up until
01:58 20 Mr. Stolarski's designations. I didn't realize that there was
01:58 21 a Slide 7.71 in Dr. Sullivan's direct.

01:58 22 If I could just bring that up for you really quick, Your
01:58 23 Honor.

01:58 24 THE COURT: Sure. Yes, sir.

01:59 25 MR. LEE: This is just one slide, but it says,

01:59 1 "NXP's interest actual value includes significant share of
01:59 2 royalties." That would be from us.

01:59 3 It would be almost impossible to cross-examine without
01:59 4 going into Fortress, which holds a carried interest --

01:59 5 THE COURT: Help me out here. Is this Intel's slide?

01:59 6 MR. LEE: That's their slide. It would require me to go
01:59 7 into Fortress.

01:59 8 THE COURT: Well, let me just say were I VLSI, I would be
01:59 9 cautious about using that slide while the Fortress issue is
01:59 10 still before me.

01:59 11 MR. CHU: Understood, Your Honor.

01:59 12 Did you hear me?

01:59 13 THE COURT: Yes, sir. I did, and Kristie did too.

01:59 14 Anything else?

01:59 15 MR. LEE: Nothing, Your Honor.

01:59 16 THE COURT: And thank you for bringing -- Mr. Lee, thank
01:59 17 you for bringing that to our attention before the jury got in.
01:59 18 That's --

01:59 19 MR. LEE: No. I didn't know when I was supposed to. I'm
02:00 20 sorry.

02:00 21 THE COURT: No. No. Anything else?

02:00 22 MS. PROCTOR: Yes, Your Honor.

02:00 23 THE COURT: Yes, ma'am. Yes, there is?

02:00 24 MS. PROCTOR: Really quickly. There are a couple of
02:00 25 summaries of voluminous evidence that show the accused revenues

02:00 1 per -- sorry, that show the accused revenues, the total accused
02:00 2 revenues and the total number of units.

02:00 3 And those are things that they've objected to, but they've
02:00 4 also objected to our bringing in all the supporting financial
02:00 5 documents that they produced because they say those include
02:00 6 additional company-wide revenues that are not accused --

02:00 7 THE COURT: I'm going to allow in summaries.

02:00 8 MS. PROCTOR: Thank you, Your Honor.

02:00 9 THE COURT: Anything else?

02:00 10 MS. PROCTOR: That's it for me for now.

02:00 11 THE COURT: Okay.

02:00 12 THE BAILIFF: All rise.

02:00 13 (Recess taken from 2:00 to 2:03.)

02:04 14 THE BAILIFF: All rise.

02:04 15 THE COURT: Please remain standing for the jury.

02:04 16 (The jury entered the courtroom at 2:04.)

02:04 17 THE COURT: You may be seated.

02:04 18 You may begin your -- you may resume your direct.

02:04 19 MS. PROCTOR: Thank you, Your Honor.

02:04 20 BY MS. PROCTOR:

02:04 21 Q. So welcome back, Dr. Sullivan.

02:04 22 A. Thank you.

02:04 23 Q. Before we jump into your slides and the calculation,
02:04 24 did you prepare some attachments that show the accused revenues
02:04 25 and the accused number of units in this case?

02:04 1 A. Yes. So those are part of the 1200 pages I referred
02:04 2 to earlier, the tables and charts and data.

02:04 3 THE COURT: I apologize. Where are we at in terms of who
02:04 4 can see what that he's discussing? Is -- should this be only
02:04 5 on monitors that the jury can see?

02:05 6 MS. PROCTOR: Let's keep everything on private monitors
02:05 7 for now so that it's confidential.

02:05 8 BY MS. PROCTOR:

02:05 9 Q. So can we turn to Plaintiff's Exhibit 3903? It
02:05 10 should be in the big binder you have there.

02:05 11 What -- it's also on the screen if that's easier,
02:05 12 Dr. Sullivan.

02:05 13 A. I see it on both places. This is a summary of United
02:05 14 States revenue for the products that are specifically accused
02:05 15 of infringing upon each of the patents.

02:06 16 So over here at the far right, you'll see the total
02:06 17 revenue associated with the '373 patent. And over here also
02:06 18 right below that is a number, which is the total U.S. revenue
02:06 19 associated with the products infringing under the '759 patent.

02:06 20 I'm not allowed to say those here in open court. Clearly
02:06 21 those are numbers that feed into the calculations.

02:06 22 MS. PROCTOR: And so I'm not sure the jury is seeing
02:06 23 those. Can we make sure that it's being published to the jury?

02:06 24 Okay. Well, we can come back to this. Although, I guess
02:07 25 they won't be able to see your slides either.

02:07 1 All right. We're back in business.

02:07 2 BY MS. PROCTOR:

02:07 3 Q. So, Dr. Sullivan, thank you for describing this
02:07 4 Exhibit 3903. Can -- and do you want to just -- now that the
02:07 5 jury can see it, just give another quick description for us?

02:07 6 A. Yes. So this is a recap. So these are the United
02:07 7 States revenues for the products that are accused of infringing
02:07 8 each of the two patents at issue here.

02:07 9 So the top line has the revenue for the products accused
02:07 10 of infringing the '373 patent listed out on an annual basis for
02:08 11 each year, and then the total is highlighted in yellow over to
02:08 12 the right in U.S. dollars.

02:08 13 And then the second row is revenue for products that are
02:08 14 infringing upon the '759 patent and -- again on an annual
02:08 15 basis. And the number at the very far right in yellow is the
02:08 16 total revenue for this time period.

02:08 17 And these are the revenues that are specific to these
02:08 18 products, and it's after what are considered discounts and
02:08 19 rebates. So it's kind of that -- think of that as that net
02:08 20 final amount of revenue that Intel receives.

02:08 21 Q. Thank you so much, Dr. Sullivan.

02:08 22 MS. PROCTOR: And, Mr. Simmons, can we pull up Plaintiff's
02:08 23 Exhibit 3904?

02:08 24 BY MS. PROCTOR:

02:08 25 Q. And, Dr. Sullivan, what is this exhibit?

02:08 1 A. This is a parallel set of data. But rather than
02:09 2 revenue, these are the unit sales. And so here, for the '373
02:09 3 patent, that's the data that are in the top row, again these
02:09 4 are unit sales by year.

02:09 5 And in the far right you can see in the total column,
02:09 6 those are the total number of unit sales across this time
02:09 7 period for the products accused of infringing the '373.

02:09 8 And then in the second row are the unit sales in the
02:09 9 United States. All of this here is for United States sales.
02:09 10 And the second row is for the products accused of infringing
02:09 11 the '759 patent, so these are the Lake family of products. And
02:09 12 the total number of unit sales is in the far right column
02:09 13 across those years.

02:09 14 Q. And if you add those two numbers up, that's how you
02:09 15 got your 987 million units; is that right?

02:09 16 A. That's exactly right.

02:09 17 Q. Great. Thank you.

02:09 18 So if we can go back to the slides, we can show the jury
02:09 19 how you use those numbers.

02:10 20 So we talked a lot about your regression model. What do
02:10 21 you do with the results of your regression model, Dr. Sullivan?

02:10 22 A. The regression model, as you recall, provides an
02:10 23 estimate, the relationship between clock speed and price. I
02:10 24 combine that with the testing information that was provided by
02:10 25 Dr. Conte and Dr. Annavaram regarding the benefits of the

02:10 1 patented technology. So in effect I combined those. It's --
02:10 2 mathematically, it's a multiplication, as I'll show you. And
02:10 3 what that does is it then provides the price benefit specific
02:10 4 to the patented technology.

02:10 5 Q. So can you show us the calculation you did for the
02:10 6 '373 patent?

02:10 7 A. Yes. So on the next slide here, I have this -- it's
02:10 8 intended to look like a chalkboard. Maybe this takes me back
02:11 9 to my teaching days.

02:11 10 Do we want --

02:11 11 Q. Want the total -- sorry. One second. Make sure we
02:11 12 get the right slide for you guys.

02:11 13 MS. PROCTOR: We want to see those accused revenues
02:11 14 multiplied by the rates Dr. Sullivan just talked about.

02:11 15 (Off-the-record discussion.)

02:11 16 THE WITNESS: Yep. Here we go.

02:11 17 BY MS. PROCTOR:

02:11 18 Q. Yeah. I'm sorry. Can you explain your calculation
02:11 19 on Slide 49, please?

02:11 20 A. Sure. So this is for the '373 patent. And as you'll
02:11 21 recall, based upon the work of Professor Conte, Professor
02:12 22 Annavaram, the power savings associated with the '373 patent is
02:12 23 5.45 percent.

02:12 24 You'll also recall from the regression that the price
02:12 25 benefit associated with this improvement is 0.64, and as we

02:12 1 just described on one of the attachments that I was showing,
02:12 2 that the total infringing revenues is this number here. And
02:12 3 this is -- we're -- right now we're looking at Slide 7.49.

02:12 4 And so just performing this multiplication provides
02:12 5 additional revenues. That is this number here. And these are
02:13 6 the additional revenues that were received by Intel as a result
02:13 7 of using the technology from the '373 patent. Thus it is a
02:13 8 fraction -- think of it in a small piece, a sliver, if you
02:13 9 will, of the overall revenues. It's just the piece that is
02:13 10 attributable to the patented technology separate and apart from
02:13 11 the other factors and features and functionalities of the
02:13 12 products.

02:13 13 Q. And just to clarify for the record, it's the
02:13 14 5.45 percent times .764, right?

02:13 15 A. Correct.

02:13 16 Q. Now, if you look at those additional revenues across
02:13 17 the number of units, what is the additional revenue on a
02:13 18 per-unit basis?

02:13 19 A. Do we have a slide on this or -- okay. We do. All
02:13 20 right.

02:14 21 So taking that additional revenue from the prior slide and
02:14 22 dividing that by the number of units, which I was showing you
02:14 23 earlier, that comes straight from Intel's financial data, that
02:14 24 results in additional revenues per unit of this amount here
02:14 25 that is listed on the bottom right of Slide 7.50.

02:14 1 Q. Thank you.

02:14 2 Now, did you perform a similar calculation for the '759
02:14 3 patent?

02:14 4 A. Yes. The calculations are parallel.

02:14 5 Q. Can you show us that calculation?

02:14 6 A. So here on Slide 7.53, you'll recall that the
02:14 7 performance improvement provided by the technology in the '759
02:14 8 patent, that was provided by the work of Professor Conte and
02:15 9 Professor Annavaram, is this amount here.

02:15 10 I multiply that by the price benefit of this number here,
02:15 11 the 0.764 that comes from the regression analysis that I
02:15 12 performed. And the revenue associated with the infringing
02:15 13 products I showed you just a couple of minutes ago, based upon
02:15 14 Intel's financial data, is this third number on the slide.

02:15 15 When I perform that multiplication, that results in
02:15 16 additional revenues that are resulting from the use of the
02:15 17 technology in the '759 patent. That is at the bottom right of
02:15 18 this slide.

02:15 19 Q. Now, what is that in terms of the number of units
02:15 20 that you also showed us for the '759 patent?

02:16 21 A. So expressing this just in terms of number of units,
02:16 22 here on Slide 7.54, here are those very same additional
02:16 23 revenues that I just calculated. And just dividing that by the
02:16 24 number of units sold that are allegedly infringing the '759
02:16 25 patent, which I showed you a few minutes ago, that results in

02:16 1 additional revenues on a per-unit basis of this amount here
02:16 2 that is listed at the bottom right of this slide.

02:16 3 Q. Thank you.

02:16 4 So does Intel dispute any of your math or any of these
02:16 5 calculations?

02:16 6 A. No. You know, there's no dispute over whether the
02:16 7 arithmetic or the calculations are performed correctly. No
02:16 8 dispute over whether the regression calculations have been
02:16 9 performed correctly. They have disputes over the regression
02:16 10 overall, but not, you know, just in terms of how the
02:17 11 calculations are performed.

02:17 12 Q. And now that you've calculated these additional
02:17 13 revenues, what's the next step in your analysis?

02:17 14 A. What I just described for you are revenues, the
02:17 15 additional revenues from using the patented technology. So the
02:17 16 next step is to look at what the costs are associated with
02:17 17 implementing the technology, and then subtracting off costs
02:17 18 would provide profit.

02:17 19 And I just want to highlight one thing here, which is the
02:17 20 word in the top row, across all of this, is "additional,"
02:17 21 right? Because when we're looking at the revenues, we're
02:17 22 looking at just the additional revenues, not the whole revenues
02:17 23 for the product. We're not looking at whole company revenue.
02:17 24 We're just looking at that increment of additional revenue.

02:17 25 That means when we're looking at the costs, we want to

02:17 1 look at the costs associated with that increment so we can
02:18 2 think about the additional profitability associated with this
02:18 3 incremental revenue.

02:18 4 Q. So what additional costs did Intel have as a result
02:18 5 of using the infringing technology?

02:18 6 A. There's two categories of costs here that might be
02:18 7 relevant.

02:18 8 So the first is, this one here that I'm listing up here on
02:18 9 Slide 56 is manufacturing costs. And the question is whether
02:18 10 implementing the technology caused Intel to incur additional
02:18 11 manufacturing costs.

02:18 12 And based upon the work of Professor Conte, the
02:18 13 determination is that there is not any additional or meaningful
02:18 14 manufacturing costs. Even though the technologies have
02:18 15 significant customer benefits, they do not require additional
02:18 16 costs in order to implement them.

02:18 17 The second category of potential sales -- excuse me --
02:19 18 potential costs are sales and marketing costs. So the idea
02:19 19 here is that as prices are higher as a result of using the
02:19 20 technology, that can cause some increase in selling costs or
02:19 21 marketing costs.

02:19 22 You know, there's some indication that for some sales that
02:19 23 Intel makes that they pay a commission to their sales personnel
02:19 24 associated with those sales. And if the prices go up, then the
02:19 25 commissions on some of the sales would go up. So I account for

02:19 1 those additional costs.

02:19 2 Q. So what is the overall relationship here between the
02:19 3 additional revenues you calculated and some additional profit?

02:19 4 A. The additional sales costs that I just referred to
02:19 5 are quite small, and I'll describe it in more detail in just a
02:20 6 moment or two. But because they are small, what this means is
02:20 7 that the additional revenue that we calculated earlier, that
02:20 8 most of it, not all of it, most of it would be considered
02:20 9 additional profit.

02:20 10 Q. So let's turn now to the fourth key topic you
02:20 11 identified, which was the relative contributions of the
02:20 12 parties.

02:20 13 Do any of the Georgia-Pacific factors relate specifically
02:20 14 to those relative contributions?

02:20 15 A. Yes. So Georgia-Pacific Factor 13 states: The
02:20 16 portion of the realizable profit that should be credited to the
02:20 17 invention as distinguished from non-patented elements.

02:20 18 And what this is recognizing is that when there are
02:20 19 additional revenues or additional profits that are generated by
02:20 20 using the patented technology, that it takes two to tango, so
02:21 21 to speak, to bring that realization, and thus we want to give
02:21 22 credit to both Freescale and Intel for their contributions.

02:21 23 Q. So based on your analysis here, how did Intel and
02:21 24 Freescale each contribute to realizing these additional
02:21 25 profits?

02:21 1 A. Freescale as the patent holder is contributing its
02:21 2 patented inventions. That's how it is contributing to the --
02:21 3 you know, to causing these additional revenues and profits to
02:21 4 occur.

02:21 5 On the other hand is Intel, and they are the ones that are
02:21 6 implementing this technology, and they have the additional
02:21 7 sales, potential sales commissions that, you know, their
02:21 8 contributions are being able to get these products to what is
02:21 9 called commercialized and in particular commercializing this
02:21 10 particular technology.

02:22 11 Q. So how did you determine what share of the additional
02:22 12 profit goes specifically to Freescale?

02:22 13 A. This is based directly upon the financial data of
02:22 14 Intel. They have in their financial data for each of their
02:22 15 products -- so I do this specific to each of the accused
02:22 16 products -- what they call total spending, and this total
02:22 17 spending is comprised or consists of these three items that I
02:22 18 have listed here. The sales and marketing, research and
02:22 19 development and general and administrative.

02:22 20 So you'll recall a moment ago we were just talking about
02:22 21 sales and marketing as potentially being an increased cost or
02:22 22 an additional cost. So I account for that here. However,
02:22 23 there are other activities that Intel undertakes to bring this
02:23 24 technology and the benefits of it into its products in the
02:23 25 marketplace. This is reflected in its research and development

02:23 1 in general and administrative expenditures, those activities.

02:23 2 And so I compare this total spending to the revenues
02:23 3 associated with these products, and it's the ratio, the
02:23 4 spending divided by the revenues, that provides a factor for
02:23 5 Intel's contributions here.

02:23 6 Now, to be clear, when Intel produced the data, they
02:23 7 provided all three of these items together. And they did not
02:23 8 split them out. So that means that the factor that I apply,
02:23 9 and you'll see this ratio factor in just a second on the next
02:23 10 slide, incorporates both the cost effects of sales and
02:23 11 marketing and separately the R&D and G&A contribution pieces.

02:24 12 So in other words, I'm doing two apportionments, one for
02:24 13 costs and one for Intel's contributions. But I do it in one
02:24 14 mathematical calculation. Well, it's just a multiplication.
02:24 15 It's just in one step that I do the actual calculation.

02:24 16 Q. So what are the actual numbers that you use in that
02:24 17 calculation?

02:24 18 A. So here they are on Slide 7.62. And it's separate
02:24 19 for each patent because the data are different for each patent.
02:24 20 This says the cost data are specific to the products accused
02:24 21 under each patent, so for the '373 patent the contribution for
02:24 22 Intel is 23.8 percent and the contribution of Freescale is
02:24 23 76.2 percent.

02:25 24 For the '759 patent, the contribution of Intel is
02:25 25 20.7 percent and the contribution for Freescale is

02:25 1 79.3 percent. And, again, this reflects both those -- that
02:25 2 cost apportionment and the contribution apportionment in one
02:25 3 calculation.

02:25 4 Q. So how do these relative contributions impact the
02:25 5 reasonable royalties you calculated?

02:25 6 A. So I take the additional revenues that I calculated
02:25 7 earlier and I showed you earlier on similar chalkboard slide, I
02:25 8 multiply it by Freescale's contribution here that we just
02:25 9 looked at, and when I perform that multiplication, that
02:25 10 provides the apportionment that gives us a reasonable royalty.

02:25 11 Q. And would you please show us your reasonable royalty
02:25 12 calculation for the '373 patent?

02:25 13 A. Yes. So for the '373 patent here on Slide 7.64, I
02:26 14 take the additional revenues that I showed you earlier. I
02:26 15 multiply that by Freescale's contribution of 76.2 percent that
02:26 16 I just showed you, and when I perform that multiplication,
02:26 17 that's what provides the reasonable royalty that is here at the
02:26 18 bottom right of Slide 7.64.

02:26 19 Q. And if we were to look at that royalty across the
02:26 20 number of units you showed us, what would that be?

02:26 21 MR. LEE: I object to the form of the question as asking
02:26 22 for the royalty across the units.

02:26 23 THE COURT: Mr. Lee, I still couldn't hear you again.

02:26 24 MR. LEE: It was a form of the question, Your Honor. It
02:26 25 was asking what the effective royalty rate was across units.

02:26 1 THE COURT: Would you restate the question?

02:26 2 MS. PROCTOR: Sure.

02:26 3 BY MS. PROCTOR:

02:26 4 Q. If we look at that amount you just calculated, how
02:27 5 does that relate to number of units?

02:27 6 A. Here on Slide 7.65 I take that reasonable royalty
02:27 7 that I just calculated and showed you, and here is the number
02:27 8 of units that are accused of infringing the '373 patent, and
02:27 9 we've already seen that a couple of times now.

02:27 10 So just performing that math, this amount here at the
02:27 11 bottom right is the reasonable royalty expressed just relative
02:27 12 to the number of units.

02:27 13 Q. And did you do any calculations for the '759 patent?

02:27 14 A. I did. And those calculations are in parallel.

02:27 15 Here on Slide 7.66, and this is for the '759 patent,
02:28 16 you'll see I have the additional revenues that I had described
02:28 17 to you earlier. I multiply that by Freescale's contribution of
02:28 18 79.3 percent that is calculated from the financial data of
02:28 19 Intel, and that provides a reasonable royalty here at the
02:28 20 bottom right when I performed that multiplication.

02:28 21 Q. And how does that relate to the number of units?

02:28 22 A. Here, when I take that reasonable royalty from the
02:28 23 prior slide, I'm now on Slide 7.67, and if I divide it by the
02:28 24 number of units, sales of Intel's Lake products that are
02:28 25 accused of infringing the '759 patent, which we have talked

02:28 1 about before, which is roughly 603 million units, that means
02:28 2 that the royalty on a per-unit basis is this amount here at the
02:29 3 bottom right of this slide.

02:29 4 Q. So I'll definitely give you a chance to summarize the
02:29 5 numbers you've calculated for us, but before we do that, I want
02:29 6 to talk a little bit about Intel's damages approach. At a high
02:29 7 level how did Intel's experts calculate damages in this case?

02:29 8 A. At a very high level, they use certain data points.
02:29 9 They look at certain prior transactions. They selected some
02:29 10 agreements that Intel has entered into and some other
02:29 11 agreements. And they looked at some items that they believe
02:29 12 are offers.

02:29 13 They consolidate these down into both a range of royalties
02:29 14 and focus on what they have referred to as a simple average of
02:30 15 those data points.

02:30 16 Q. And are any of the -- are any of those data points
02:30 17 considered by Intel's experts useful in determining a
02:30 18 reasonable royalty for Intel's use of the invention?

02:30 19 A. In my view, they are not. These are all historical
02:30 20 types of agreements or transactions that do not reflect Intel's
02:30 21 use of the patented technologies or the benefits that Intel
02:30 22 actually received from the use of the technologies.

02:30 23 There's a -- I think it's a fun example to help illustrate
02:30 24 this. So recently in the Super Bowl, we had Tom Brady and
02:30 25 Patrick Mahomes. Tom Brady, when he was a rookie, was drafted

02:30 1 as the 199th pick as a rookie, and then, of course, he goes on
02:30 2 over time and becomes one of the most storied quarterbacks of
02:31 3 all time, going to ten Super Bowls and winning seven of them.

02:31 4 Somewhat similarly for Patrick Mahomes, when he was a
02:31 5 rookie, he got a very healthy package of \$10 million, give or
02:31 6 take, but over time as his true value became realized, his
02:31 7 performance became known, he then received an enormous
02:31 8 compensation package of roughly \$500 million.

02:31 9 The point is that as information becomes known and the
02:31 10 uncertainties become resolved, then the numbers can change,
02:31 11 just like we wouldn't think that Tom Brady as the 199th pick is
02:31 12 the answer to his current contributions to the Buccaneers.

02:31 13 Q. So I want to take one more little detour relating to
02:31 14 this slide while we're on this example. Do the rates people
02:31 15 charge in your industry vary significantly, like what you just
02:32 16 talked about?

02:32 17 A. They do. Now, they range anywhere from around 300 to
02:32 18 \$500 to more than \$2,000 per hour.

02:32 19 Q. And you mentioned that only around 50 percent of your
02:32 20 work is for litigation; is that right?

02:32 21 A. Roughly speaking.

02:32 22 Q. Do you charge different rates for the 50 percent of
02:32 23 work you do on other matters, other -- for the companies?

02:32 24 A. My firm receives the same rates regardless of whether
02:32 25 it's litigation-related work or non-litigation.

02:32 1 Q. So are there -- what other projects have you worked
02:32 2 on outside of litigation?

02:32 3 A. Well, I've brought up this example with the NFL.
02:32 4 There's a few others that I've worked on that I find to be
02:32 5 really fun ones.

02:32 6 One was working with the Players Association for the NBA.
02:32 7 They went through a negotiation in 2016 over the collective
02:33 8 bargaining agreement, and I worked performing economic analysis
02:33 9 on behalf of the Players Association for the NBA so that they
02:33 10 could come to an agreement with the League. And that was one
02:33 11 of the more enjoyable projects I've done.

02:33 12 Also in sports, you know, I did work for the Boston Red
02:33 13 Sox to help them develop algorithms for pricing of tickets.
02:33 14 Now, granted this was preCOVID, but the idea was that we could
02:33 15 better have prices in different parts of the stadium at
02:33 16 different times to be able to get more people to the games, and
02:33 17 so we helped set up what those algorithms are.

02:33 18 A couple of other examples, I worked with an online
02:33 19 retailer known as wine.com. And they provide and sell many
02:33 20 bottles and different types of wine throughout the United
02:34 21 States.

02:34 22 So we developed pricing algorithms based upon each of
02:34 23 their bottles relative to other online retailers as well as
02:34 24 brick and mortar, and so we would do this on a -- what's called
02:34 25 a SKU basis, each and every bottle.

02:34 1 We set up statistical algorithms that would see, okay,
02:34 2 what's really the right price for that day for that bottle?
02:34 3 And some prices would change, and some would stay the same.

02:34 4 The last one I'll share with you is one I also really
02:34 5 enjoyed. So you may recall there was a movie about five or six
02:34 6 years ago called Joy. And it was about Joy Mangano, who had
02:34 7 been on Home Shopping Network selling the Miracle Mop, and it's
02:34 8 the story of her and her development as a person and a
02:34 9 professional. She was played by Jennifer Lawrence and the
02:35 10 movie had Robert DeNiro and Bradley Cooper.

02:35 11 So right around the time of this movie, Home Shopping
02:35 12 Network was looking to bring more of Joy's products, not just
02:35 13 to be on HSN but also to be in brick and mortar stores, such as
02:35 14 Target and Bed Bath and Beyond, so I worked with them to
02:35 15 develop the business plan, the business strategy and the
02:35 16 logistics and the pricing to establish the right way to do that
02:35 17 launch associated right around the time of the movie.

02:35 18 So those are a few of the examples that I've really
02:35 19 enjoyed.

02:35 20 Q. Thanks, Dr. Sullivan.

02:35 21 So if we go back to your example with Patrick Mahomes and
02:35 22 Tom Brady, how does that relate to Intel's approach here?

02:35 23 A. In my view, based upon the statute, the right way to
02:35 24 calculate a reasonable royalty is by looking at the technical
02:35 25 benefits that are provided by these particular patents, by

02:36 1 utilizing Intel's data, the financial data, the feature data
02:36 2 and thus determine what the extent of use is and the value is
02:36 3 associated with that use.

02:36 4 By the very nature of the historical data points that
02:36 5 Intel uses for their analysis, it does not use any of those.
02:36 6 It's not related to these specific patents. It's not related
02:36 7 to the benefits that Intel has actually received, and in my
02:36 8 view, that results in their damages analysis not being correct.

02:36 9 Q. And I just want to clarify one point my colleague
02:36 10 pointed out. Going back to the work you just described, how
02:36 11 sometimes in litigation, sometimes outside of litigation on
02:36 12 those cool projects you were telling us about, in both cases
02:36 13 would you consider the rate you're being paid to be a customary
02:37 14 rate in the industry?

02:37 15 A. Oh, yes. Definitely.

02:37 16 Q. And you charge the same rates in both circumstances?

02:37 17 A. I do. Granted, I'm very fortunate. I have worked
02:37 18 super hard throughout my entire life to get to where I'm at.
02:37 19 Sorry. So yes. It is customary in my field, and I recognize
02:37 20 it is very substantial. I think I've earned it.

02:37 21 Q. Thank you, Doctor.

02:37 22 So do Intel's experts in doing this analysis, do they
02:37 23 account for Intel's use of the patents?

02:37 24 A. No. They don't. So if -- so this is kind of
02:37 25 interesting to me.

02:37 1 You know, as I mentioned earlier, the statute provides
02:37 2 that, you know, the royalty, the reasonable royalty should be
02:38 3 for the use made of the invention by the infringer. When we
02:38 4 look at the real-world data, there's two types of real-world
02:38 5 data that you can consider about use.

02:38 6 There's data over here. This is intended to be a bar here
02:38 7 to show Intel's proposed royalty. It's not very much. And
02:38 8 it -- it's based upon real-world agreements perhaps, but
02:38 9 they're not reflecting the use of this technology and Intel's
02:38 10 benefit of this technology.

02:38 11 The analysis that I performed uses Intel's real-world data
02:38 12 to look at their actual sales, to look at the actual benefits
02:39 13 that they received. And here on Slide 73, you can see that
02:39 14 when we add up, you know, for both patents the additional
02:39 15 revenue that I've already shown you, it's the number up here at
02:39 16 the top, and that's based upon Intel's real-world data and the
02:39 17 real world benefits.

02:39 18 Q. And in calculating its proposed royalty here, that
02:39 19 red bar, did Intel's experts rely on all of the licenses that
02:39 20 were produced in this case?

02:39 21 A. Oh, no. There's several hundred license agreements
02:39 22 that Intel produced, and Intel's experts rely upon a relatively
02:39 23 small set of those. You know, they are all lower dollar amount
02:39 24 ones. Yet there are a number of other agreements that they
02:39 25 decided not to use that have much, much higher dollar amounts.

02:40 1 Q. And do any of those licenses, the executed license
02:40 2 agreements that Intel's damages experts looked at, do any of
02:40 3 them involve the patents-in-suit here?

02:40 4 A. No.

02:40 5 Q. So let's go back to the law, and you described that
02:40 6 as requiring a hypothetical negotiation. So at that
02:40 7 hypothetical negotiation, what are some of the key
02:40 8 considerations? Taking into account all of the analysis you've
02:40 9 done, what do you think those key considerations are for the
02:40 10 parties?

02:40 11 A. In my view -- I've put them here on Slide 74, and
02:40 12 we've talked about these already. There's the power savings of
02:40 13 5.45 percent associated and attributable to the '373 patented
02:40 14 technology.

02:40 15 There's the performance improvement of 1.11 percent
02:40 16 that's attributable to the '759 patent. This results in
02:40 17 additional revenue that I have calculated specific to these
02:41 18 patented technologies and a number of unit sales of -- for both
02:41 19 patents combined of 987 million units. And this is something
02:41 20 where all of these items can be considered in determining a
02:41 21 reasonable royalty.

02:41 22 And here again, the magnitudes are significant. They're
02:41 23 substantial. And I had been trying to think of a way to, you
02:41 24 know, how do I convey this in a way that makes sense and
02:41 25 provide that context? And what I came up with, this is one

02:41 1 example, is that for the 987 million products, each one of
02:41 2 these is pretty small. I know that you've, you know, kind of
02:41 3 seen some of these from a distance. They're typically less
02:42 4 than two inches wide.

02:42 5 If you were to line them all up next to each other, they
02:42 6 would be about 25,000 miles long. It would go all the way
02:42 7 around Earth. That's a lot of product, a lot of product.

02:42 8 Q. Thank you, Dr. Sullivan.

02:42 9 So can you summarize your reasonable royalty findings for
02:42 10 us?

02:42 11 A. Yes. Based upon --

02:42 12 MR. LEE: Your Honor, I object. If you look at the --
02:42 13 before the jurors see this slide. If you look at the fourth
02:42 14 column over.

02:42 15 THE COURT: I can't see the slide unless...

02:42 16 MS. PROCTOR: I think they're going to make a quick change
02:42 17 to it, Your Honor. I apologize for that.

02:42 18 THE COURT: No problem.

02:42 19 BY MS. PROCTOR:

02:43 20 Q. So let's try that again. Dr. Sullivan, can you
02:43 21 summarize your reasonable royalty findings for us?

02:43 22 A. Yes. So here on Slide 7.76 are the numbers. Just a
02:43 23 quick recap. In the analysis I performed, I looked at the
02:43 24 nature of competition in the marketplace, the need for Intel to
02:43 25 continue to innovate, the importance of these particular

02:43 1 patents in terms of power savings and performance improvement.

02:43 2 I looked at that relative to clock speed, used financial
02:43 3 data and feature data to be able to determine what the price
02:43 4 effects are and then directly attributable to the patented
02:44 5 technologies, calculated additional revenues that are
02:44 6 attributable to the patents specifically, and then accounted
02:44 7 for both additional costs and the commercialization
02:44 8 contributions of Intel relative to the patented contributions
02:44 9 of Freescale.

02:44 10 That results, for the '373 patent, additional revenues
02:44 11 relative to a reasonable royalty. You'll see -- I suppose I
02:44 12 can't say what the difference is roughly, but you can probably
02:44 13 calculate that fairly easily. Recognizing that not all but
02:44 14 most of that difference is profit, that then is maintained by
02:44 15 Intel.

02:44 16 That's the incentive for them to enter into this agreement
02:44 17 because it is not only profit enhancing for them but also
02:45 18 allows them to maintain their position in the marketplace.

02:45 19 We discussed the number of units that are infringing, thus
02:45 20 taking the royalty, dividing by the number of units. It's that
02:45 21 amount per unit. And the same is true for the '759 patent.
02:45 22 You can look at the additional revenues and compare those to
02:45 23 the reasonable royalty. Most of that difference is profit that
02:45 24 would be retained by Intel.

02:45 25 Here again is the number of infringing units. That means

02:45 1 that on a per-unit basis, this is the royalty for the '759
02:45 2 patent.

02:45 3 Q. And so based on your analysis, Intel is getting the
02:45 4 benefit of hundreds of millions of dollars in profit from these
02:45 5 patents?

02:45 6 A. Correct.

02:45 7 Q. And Intel's actually keeping hundreds of millions of
02:45 8 dollars in profit on these patents even after paying the
02:46 9 royalties that you proposed?

02:46 10 A. That's right. So it's profit -- it's profit
02:46 11 enhancing for Intel to pay these royalties in two ways.

02:46 12 One, the direct benefits, as we were just describing, of
02:46 13 having those additional profits, but also because of their
02:46 14 ability to maintain sales in the competitive marketplace to
02:46 15 maintain their position.

02:46 16 Q. So, Dr. Sullivan, in your opinion, are these
02:46 17 royalties reasonable?

02:46 18 A. Yes. In my view they are. They are very
02:46 19 substantial. I recognize that. However, they do reflect the
02:46 20 actual benefits that Intel has received, reflects the
02:46 21 substantial use by Intel, and it reflects that the profits are
02:46 22 shared between the parties, and it is a profit-enhancing
02:46 23 proposition for Intel.

02:46 24 Q. Thank you very much, Dr. Sullivan.

02:46 25 MS. PROCTOR: That's all for now.

02:47 1 THE COURT: Mr. Lee, will you be doing the cross?

02:47 2 MR. LEE: Yes, Your Honor.

02:47 3 THE COURT: Do you need a moment to -- would it help you
02:47 4 if we took a break or...

02:47 5 MR. LEE: Yeah. Then we can get the binders around and
02:47 6 get set up.

02:47 7 THE COURT: Let's do that. We'll take literally just a
02:47 8 five- or ten-minute recess and we'll be right back.
02:47 9 Remembering my instructions not to discuss the case.

02:47 10 (Jury exited the courtroom at 2:47.)

02:47 11 THE COURT: Mr. Lee? There you are. Is there anything we
02:47 12 need to take up before I come back in?

02:48 13 MR. LEE: No.

02:48 14 THE COURT: Mr. Chu?

02:48 15 MR. CHU: No, Your Honor.

02:48 16 THE COURT: We'll be back in just a couple of minutes.

02:54 17 (Recess taken from 2:48 to 2:57.)

02:57 18 THE BAILIFF: All rise.

02:57 19 THE COURT: Please remain standing for the jury.

02:57 20 (Jury entered the courtroom at 2:57.)

02:57 21 THE COURT: Ladies and gentlemen, thank you for coming
02:57 22 back. You may be seated.

02:57 23 Mr. Lee?

02:57 24 MR. LEE: Thank you, Your Honor.

02:57 25 CROSS-EXAMINATION

02:57 1 BY MR. LEE:

02:57 2 Q. Good afternoon, Dr. Sullivan.

02:57 3 A. Good afternoon.

02:57 4 Q. Dr. Sullivan, you told the ladies and gentlemen of
02:57 5 the jury earlier today that you've worked both for plaintiffs
02:57 6 and defendants, correct?

02:57 7 A. That's right.

02:57 8 Q. And you understand having worked for defendants in
02:57 9 patent cases that it's important for the jurors to hear the
02:57 10 full story on all issues, correct?

02:57 11 A. I do believe that it's important to listen, hear and
02:58 12 think through all the issues. Yes.

02:58 13 Q. And it's important to hear the defendant's case on
02:58 14 damages in order to -- before you determine the issue of
02:58 15 damages, correct?

02:58 16 A. I would agree.

02:58 17 Q. Now, you know that Intel has a damages expert named
02:58 18 Hance Huston, correct?

02:58 19 A. That's right.

02:58 20 Q. You didn't mention him by name today, correct?

02:58 21 A. That's right.

02:58 22 Q. But you have read his reports, correct?

02:58 23 A. Yes. I have.

02:58 24 Q. Now, I want to ask you about some testimony you gave
02:58 25 about whether SigmaTel, Freescale or NXP made use of the

02:58 1 patents. Do you recall that testimony?

02:58 2 A. Yes. I do.

02:58 3 Q. And you said that you thought it was a red herring
02:58 4 and misleading to talk about that issue. Do you remember that?

02:58 5 A. Not to talk about the issue yet my perception of the
02:58 6 arguments that Intel and, with all due respect, you, Mr. Lee,
02:59 7 have been making. I do believe those issues are, as I would
02:59 8 describe them, a red herring and misleading.

02:59 9 Q. Yeah. That's what you said. You said they were a
02:59 10 red herring and misleading, correct?

02:59 11 A. Yes.

02:59 12 Q. Now, Hance Huston has given the opinion that what
02:59 13 SigmaTel and Freescale and NXP did with the patents tells you a
02:59 14 lot about the value of the patents, hasn't he?

02:59 15 A. He has said something along those lines.

02:59 16 Q. Right. And he --

02:59 17 A. I disagree, but yes.

02:59 18 Q. My question was focused on him. Has he given the
02:59 19 opinion in his reports that what SigmaTel, Freescale and NXP
02:59 20 did with the patents is important in determining the value? He
02:59 21 did that, didn't he?

02:59 22 A. That is my recollection.

02:59 23 Q. Now, when he did that, he specifically referred to
02:59 24 the Georgia-Pacific factors, correct?

03:00 25 A. He may have. I don't have that level of specificity

03:00 1 in mind.

03:00 2 Q. But you referred to the Georgia-Pacific factors this
03:00 3 morning, correct?

03:00 4 A. Yes. I did.

03:00 5 Q. And you put on the screen PDX-7.124 a little bit. Do
03:00 6 you recall this?

03:00 7 A. I do. I even made the slide. So yes.

03:00 8 Q. Now, these are the factors from this case called
03:00 9 Georgia-Pacific, correct?

03:00 10 A. That's right.

03:00 11 Q. And these are the factors that you examined, correct?

03:00 12 A. Yes. Amongst others, but yes. I did examine these.

03:00 13 Q. And you expect that His Honor will instruct the jury
03:00 14 that they should apply these factors in determining the issue
03:00 15 of a reasonable royalty, correct?

03:00 16 A. I will defer to Your Honor in terms of what it is
03:00 17 that the jury is instructed. I would imagine that part of
03:00 18 those instructions will be to consider the Georgia-Pacific
03:01 19 factors.

03:01 20 Q. So the answer's yes?

03:01 21 A. The one distinction there -- two distinctions. One
03:01 22 is I cannot speak on behalf of the Court. The other
03:01 23 distinction is that the Georgia-Pacific factors, albeit as
03:01 24 something that provides a guidepost, is not typically --
03:01 25 damages are not constrained to those factors only.

03:01 1 Q. I'm sorry if my question wasn't clear. I didn't ask
03:01 2 if damages were constrained. I just asked whether you
03:01 3 understood that His Honor would instruct on the factors. Just
03:01 4 yes or no.

03:01 5 A. I would imagine that His Honor will instruct on the
03:01 6 factors in some way, shape or form.

03:01 7 Q. Okay. So, now we know that -- I want to focus a
03:01 8 little bit on your slide. You know that Mr. Huston actually is
03:01 9 someone who has an electrical engineering degree, correct?

03:01 10 A. I do not recall his degree.

03:01 11 Q. Well, we'll wait till he testifies before the jury.

03:02 12 But he did say that Factors 8, 9 and 10 of the
03:02 13 Georgia-Pacific factors specifically implicate whether the
03:02 14 licensor has made use of the patent, correct? Isn't that what
03:02 15 he said?

03:02 16 A. I cannot speak to what Mr. Huston has said. I can
03:02 17 provide you with my opinions in these regards --

03:02 18 MR. LEE: Your Honor?

03:02 19 THE WITNESS: -- but I cannot speak for Mr. Huston.

03:02 20 THE COURT: Dr. Sullivan, just yes or no. That'd be fine.

03:02 21 MR. LEE: Your Honor, if we --

03:02 22 THE COURT: If you could just repeat the question. He'll
03:02 23 answer it directly. And I'm sure he will going forward as
03:02 24 well.

03:02 25 BY MR. LEE:

03:02 1 Q. Dr. Sullivan, Mr. Huston specifically relied upon
03:02 2 Factors 8, 9 and 10 as related to the question of whether
03:02 3 SigmaTel, Freescale and NXP made use of the patent, didn't he?

03:02 4 A. I recall something along those lines from Mr. Huston.

03:03 5 Q. So let's look at Factor No. 10. Now, this is not one
03:03 6 of the factors that you focused upon or highlighted, correct?

03:03 7 A. I disagree.

03:03 8 Q. Well, let's focus on it together. It is "the nature
03:03 9 of the patented invention, the character of the commercial
03:03 10 embodiment of it as owned and produced by the licensor and the
03:03 11 benefits to those who have used the invention."

03:03 12 Do you see that?

03:03 13 A. I do.

03:03 14 Q. Now, when the ladies and gentlemen of the jury apply
03:03 15 Factor 10, if they do to this case, the licensor is Freescale,
03:03 16 correct?

03:03 17 A. The licensor is Freescale.

03:03 18 Q. And --

03:03 19 A. There are other parts to the factor.

03:03 20 Q. And Factor 10 specifically refers to the licensor,
03:03 21 correct?

03:03 22 A. And the use of the invention. Yes.

03:04 23 Q. Yes. And if the licensor doesn't use the invention
03:04 24 at all, it tells you something, doesn't it?

03:04 25 A. No. It does not.

03:04 1 Q. Okay. You think that suggesting the fact that the
03:04 2 licensor does not have a commercial embodiment, to use the
03:04 3 words of Factor 10, is a red herring and misleading? Is that
03:04 4 your testimony?

03:04 5 A. Yes.

03:04 6 Q. Okay. Now, I'm going to come back to those factors,
03:04 7 but I wanted -- as you said, one of the people you are accusing
03:04 8 of being misleading was me. And I wanted to clarify and be
03:04 9 sure we were on the same page.

03:04 10 Now, as you told us, you're not here to give an opinion on
03:04 11 infringement, correct?

03:04 12 A. That's right.

03:04 13 Q. So when you used the term "infringing units" during
03:04 14 your testimony today, you were assuming that the jury found
03:04 15 them based upon Dr. Conte's testimony to be infringing,
03:04 16 correct?

03:04 17 A. Correct. As a damages expert it is my role to simply
03:05 18 assume infringement.

03:05 19 Q. All right. But you agree if Intel does not infringe
03:05 20 the '373 patent, then the damages that the jury should award
03:05 21 for that patent would be zero, correct?

03:05 22 A. I think that is correct.

03:05 23 Q. And if the jury finds the '759 patent does not
03:05 24 infringe, the damages would be zero, correct?

03:05 25 A. I believe that's correct.

03:05 1 Q. And if the jury finds the '759 patent is invalid, the
03:05 2 damages would be zero, correct?

03:05 3 A. That would be my understanding.

03:05 4 Q. Now, you understand, and you told the jury that
03:05 5 Intel's -- the products accused of infringement are
03:05 6 microprocessors, correct?

03:05 7 A. Yes.

03:05 8 Q. You yourself do not have an engineering degree,
03:05 9 correct?

03:05 10 A. That's right.

03:05 11 Q. You have never designed a microprocessor, correct?

03:05 12 A. That too is correct.

03:05 13 Q. You have never worked as an engineer at a
03:06 14 microprocessor company, correct?

03:06 15 A. Correct.

03:06 16 Q. You described your company, Intensity, as an
03:06 17 economics and data science firm, correct?

03:06 18 A. Yes. That's right.

03:06 19 Q. Okay. And as you told us, you do consulting work.
03:06 20 You do litigation work, correct?

03:06 21 A. Yes.

03:06 22 Q. Now, you submitted an expert report in this case in
03:06 23 August of 2020, correct?

03:06 24 A. Yes.

03:06 25 Q. And that's the report you described to Ms. Proctor

03:06 1 earlier today, correct?

03:06 2 A. Yes.

03:06 3 Q. And then after that point in time, you actually had
03:06 4 your deposition taken where we got to ask you questions,
03:06 5 correct?

03:06 6 A. Yes. Two days of deposition.

03:06 7 Q. As of the time of your deposition, you could not
03:06 8 identify any time you had been the lead negotiator for a
03:06 9 microprocessor patent license; is that correct?

03:06 10 A. That's right. I do not serve as a lead negotiator.

03:07 11 Q. And just to be clear, the hypothetical that you've
03:07 12 been discussing with us today is a hypothetical license
03:07 13 negotiation, correct?

03:07 14 A. I'm not sure what you mean by that.

03:07 15 Q. It's a hypothetical license negotiation that's going
03:07 16 to occur. That's the phrase, correct?

03:07 17 A. I've not really heard it referred to as such. It's a
03:07 18 hypothetical negotiation where the parties negotiate over a
03:07 19 license to the patented technology.

03:07 20 Q. Okay. If that's a description you're comfortable
03:07 21 with, let's use that description.

03:07 22 Now, you've been retained by the plaintiff in this case
03:07 23 VLSI, correct?

03:07 24 A. My firm has. Yes.

03:07 25 Q. You've actually been hired as an expert in litigation

03:07 1 cases more than 150 times, have you not?

03:07 2 A. I believe that's correct.

03:07 3 Q. And you've actually worked on probably more than 300
03:07 4 litigation cases, correct?

03:08 5 A. Throughout my career, yes.

03:08 6 Q. Now, you told us your hourly rate is \$1,150 an hour,
03:08 7 correct?

03:08 8 A. Yes.

03:08 9 Q. Now, before your deposition in September, your
03:08 10 company had billed VLSI for your time plus the time of others,
03:08 11 correct?

03:08 12 A. Yes.

03:08 13 Q. As of September of 2020, so about five months ago,
03:08 14 you yourself had worked 200 hours or more, correct?

03:08 15 A. I believe that's about right.

03:08 16 Q. And as of today, you've worked 300 hours or more,
03:08 17 correct?

03:08 18 A. Yes.

03:08 19 Q. So for your time, your company's billing is somewhere
03:08 20 in excess of \$300,000, correct?

03:08 21 A. Yes.

03:08 22 Q. But there are other individuals at your company who
03:08 23 are also billing time, correct?

03:08 24 A. Yes, that's right.

03:08 25 Q. There are six of them, correct?

03:08 1 A. Who have worked on this engagement from time to time,
03:08 2 that's right.

03:09 3 Q. And they have hourly rates as well, correct?

03:09 4 A. They do.

03:09 5 Q. Their hourly rates vary from \$250 an hour to \$800 an
03:09 6 hour, correct?

03:09 7 A. I believe that's correct.

03:09 8 Q. And they've worked another 300 hours or so, correct?

03:09 9 A. Collectively or all total across the team?

03:09 10 Q. I would say collectively, all-told across the team,
03:09 11 right up until today.

03:09 12 A. I'm sorry. I did not follow.

03:09 13 Q. Sure. For the other six people, I'm not trying to
03:09 14 ask you to break them down, just for those six people other
03:09 15 than you, have they collectively worked since the beginning of
03:09 16 the case until today, 300 hours or so?

03:09 17 A. I would think something along those lines.

03:09 18 Q. So in total Intensity's been paid or will be paid
03:09 19 somewhere close to \$500,000 for your work in this case,
03:09 20 correct?

03:09 21 A. I have not examined the data on that, but something
03:10 22 along those lines would be about correct.

03:10 23 Q. Now, you are working for VLSI Technology, correct?

03:10 24 A. No. The firm was engaged on behalf of VLSI
03:10 25 Technology LLC, I believe.

03:10 1 Q. Fair enough. And it was formed in 2016, correct?

03:10 2 A. Yes. That is my understanding.

03:10 3 Q. There are two people who work at VLSI, if I can call
03:10 4 it that. If I refer to it as just VLSI, you'll understand what
03:10 5 I mean?

03:10 6 A. Yes.

03:10 7 Q. There are two people who work at VLSI, correct?

03:10 8 A. That is my understanding.

03:10 9 Q. One is Michael Stolarski, correct?

03:10 10 A. Yes.

03:10 11 Q. Before you formed your opinions about the reasonable
03:10 12 royalties in this case, did you meet with Mr. Stolarski?

03:10 13 A. No. I did not.

03:10 14 Q. Did you talk to Mr. Stolarski?

03:10 15 A. No.

03:10 16 Q. Did you meet -- Cindy Simpson is the chief technology
03:11 17 officer of VLSI. Have you ever met with her?

03:11 18 A. No. I have not.

03:11 19 Q. Have you ever met with either Mr. Stolarski -- have
03:11 20 you ever met with Mr. Stolarski in person at any time?

03:11 21 A. Yes. I met him, I think it was yesterday or the day
03:11 22 before. Yeah, here in the trial.

03:11 23 Q. Okay. So the first time you met Mr. Stolarski was
03:11 24 yesterday, that would be Tuesday, in connection with the trial,
03:11 25 correct?

03:11 1 A. Yes.

03:11 2 Q. And you've never met Cindy Simpson, the chief
03:11 3 technology officer, correct?

03:11 4 A. That's right.

03:11 5 Q. But you do know that VLSI does not design
03:11 6 microprocessors, correct?

03:11 7 A. That is my understanding.

03:11 8 Q. They do not manufacture microprocessors, correct?

03:11 9 A. That too is my understanding.

03:11 10 Q. They don't manufacture any product of any kind, do
03:12 11 they?

03:12 12 A. I'm not aware of them manufacturing any sort of
03:12 13 physical product.

03:12 14 Q. They've never sold any products, correct?

03:12 15 A. Not a physical product.

03:12 16 Q. And they don't have any engineers or technologists or
03:12 17 scientists who are engaged in research and development,
03:12 18 correct?

03:12 19 A. Not as employees as I understand it.

03:12 20 Q. And no one at VLSI has ever filed for a patent
03:12 21 application as a person working for VLSI, correct?

03:12 22 A. I am not aware of any patents being filed by
03:12 23 Ms. Simpson or Mr. Stolarski.

03:12 24 Q. Okay. And in fact, before you were hired by my
03:12 25 colleagues at Irell & Manella, you had never heard of VLSI,

03:13 1 correct?

03:13 2 A. I think that's right.

03:13 3 Q. Now, one company you had heard of before this
03:13 4 litigation was Intel, correct?

03:13 5 A. Yes.

03:13 6 Q. And as you told the jurors, Intel manufactures
03:13 7 microprocessors and has for almost 50 years, correct?

03:13 8 A. I didn't hear the time period.

03:13 9 Q. 50 years.

03:13 10 A. No. I don't think I mentioned that. I think it's
03:13 11 true, but --

03:13 12 Q. I'm sorry.

03:13 13 A. -- I don't think I mentioned it.

03:13 14 Q. I'm sorry. If I misstated the question, I apologize.
03:13 15 I didn't ask whether you'd mentioned it. I said, you know that
03:13 16 Intel has been making microprocessors for 50 years, correct?

03:13 17 A. That's my understanding. Yes.

03:13 18 Q. And there have been thousands of engineers who have
03:13 19 worked on making those -- designing those products, making
03:13 20 those products and selling them, correct?

03:13 21 A. Thousands of engineers designing in a system with the
03:14 22 manufacturing. I think some of the engineers help on the sales
03:14 23 side, but there's also other non-engineer types on the sales
03:14 24 side.

03:14 25 Q. Fair enough. Now, you talked about large numbers of

03:14 1 sales to the jurors during your direct testimony, correct?

03:14 2 A. In my view the sales are large and significant.

03:14 3 Q. Intel has been very successful in selling

03:14 4 microprocessors over 50 years, correct?

03:14 5 A. They have experienced significant financial success.

03:14 6 Q. They were successful before the '373 patent was

03:14 7 applied for, and they were selling a ton of microprocessors

03:14 8 before that patent was applied for, correct?

03:14 9 A. I think that's right.

03:14 10 Q. They were successful before the '759 patent was

03:14 11 applied for, and they were selling a ton of microprocessors

03:14 12 before that time, correct?

03:14 13 A. Similarly. Yes.

03:15 14 Q. And they continued to sell a ton of microprocessors

03:15 15 after the patents were applied for, after the patents were

03:15 16 issued, right up until today, correct?

03:15 17 A. Yes.

03:15 18 Q. All right. Now, you know that Intel manufactures

03:15 19 these microprocessors, these -- the number that you say would

03:15 20 basically surround the world. And they manufacture them in a

03:15 21 number of locations, correct?

03:15 22 A. Yes.

03:15 23 Q. This includes Arizona, correct?

03:15 24 A. That's one location.

03:15 25 Q. Oregon, correct?

03:15 1 A. That's a second.

03:15 2 Q. And New Mexico, correct?

03:15 3 A. That is my understanding.

03:15 4 Q. And you know that Intel also has facilities right
03:15 5 here in Texas, correct?

03:15 6 A. That too is my understanding.

03:15 7 Q. And Intel has in the United States more than 10,000
03:16 8 people involved in manufacturing these microprocessors, that if
03:16 9 laid end-to-end would surround the world, correct?

03:16 10 A. Yes and no. You're mixing a couple of items there,
03:16 11 but close.

03:16 12 Q. And you know it has as many as 1,700 people working
03:16 13 in Austin doing research and development on the next
03:16 14 generations of technologies so that Intel can continue to sell
03:16 15 a ton of microprocessors, correct?

03:16 16 A. I know there are roughly that number of employees,
03:16 17 and I know some of them at least are working on R&D. I can't
03:16 18 speak to all of them.

03:16 19 Q. And you know that Intel has made significant
03:16 20 inventions and innovations of its own that are in its products,
03:16 21 correct?

03:16 22 A. That is my understanding.

03:16 23 Q. And you know that those products are complex
03:16 24 products, correct?

03:16 25 A. Yes. They are complex.

03:16 1 Q. With many features?

03:16 2 A. Yes.

03:17 3 Q. Billions of transistors, as you told us earlier
03:17 4 today?

03:17 5 A. I'm sorry. I did not follow the question.

03:17 6 Q. Billions of transistors in a single microprocessor?

03:17 7 A. Yes.

03:17 8 Q. Correct?

03:17 9 A. There are.

03:17 10 Q. And those billions of transistors result in many
03:17 11 features, correct?

03:17 12 A. I would think of it a little bit differently, that
03:17 13 there are many features in the products, and there are billions
03:17 14 of transistors on the products. I don't think of it in the
03:17 15 same causality as you suggested.

03:17 16 Q. And some of those features contribute to power and
03:17 17 power savings, correct?

03:17 18 A. Yes.

03:17 19 Q. And some of those features contribute to speed and
03:17 20 performance, correct?

03:17 21 A. That too is true.

03:17 22 Q. And many of those features have nothing to do with
03:17 23 what VLSI accuses of infringing in this case, correct?

03:17 24 A. They are different.

03:17 25 Q. Yeah. Now, let me ask you a few questions about

03:18 1 these patents in particular. There are two. One is the '373
03:18 2 which issued in 2009, correct?

03:18 3 A. Yes.

03:18 4 Q. There are -- there is the '759 patent that issued in
03:18 5 2010, correct?

03:18 6 A. Yes.

03:18 7 Q. So both patents have been around for more than a
03:18 8 decade, correct?

03:18 9 A. Correct.

03:18 10 Q. Now, as you told us at your deposition, you've
03:18 11 reviewed a gazillion patents. That was your word, correct?

03:18 12 A. I'm sorry?

03:18 13 Q. You told us that you had reviewed a gazillion
03:18 14 patents, correct?

03:18 15 A. I don't recall saying that, but it's true.

03:18 16 Q. You would agree that you have. You've reviewed a lot
03:18 17 of patents?

03:18 18 A. I have, yes.

03:18 19 Q. All right.

03:18 20 A. Yes.

03:18 21 Q. But the first time you ever saw these patents was in
03:18 22 the second half of 2019, correct?

03:18 23 A. Yes. That's right. That's very typical.

03:19 24 Q. That was after you were retained to act as a damages
03:19 25 expert in this case, correct?

03:19 1 A. Yes. Exactly.

03:19 2 Q. And in all your work both in litigation but also in
03:19 3 the consulting work you've done for other purposes, you had
03:19 4 never even heard of these patents, correct?

03:19 5 A. That's right.

03:19 6 Q. You had never heard of the inventors of these
03:19 7 patents, correct?

03:19 8 A. I think that's right.

03:19 9 Q. Incidentally, in preparing your analysis did you talk
03:19 10 to any of the inventors of either patent? Now, one inventor,
03:19 11 Mr. Henson's passed away, but did you talk to any of the other
03:19 12 four?

03:19 13 A. No, I did not.

03:19 14 Q. Now, you would agree with me that the '373 and the
03:19 15 '759 patents are not the only patents related to
03:19 16 microprocessors that have been issued by the United States
03:19 17 Patent Office, correct?

03:19 18 A. I would definitely agree with you on that one.

03:20 19 Q. In fact, there are probably hundreds of patents that
03:20 20 relate to microprocessor features that have been issued by the
03:20 21 same Patent Office, correct?

03:20 22 A. By the US PTO, yes.

03:20 23 Q. Yes. And many of those microprocessor patents were
03:20 24 issued before the '373 and '759 patents, correct?

03:20 25 A. Yes.

03:20 1 Q. And some of those patents identified improved power
03:20 2 savings, correct?

03:20 3 A. I would imagine that they have.

03:20 4 Q. And somebody identified improved performance as well,
03:20 5 correct?

03:20 6 A. Yes.

03:20 7 Q. Now, the '759 patent was originally owned by
03:20 8 SigmaTel, correct?

03:20 9 A. Yes.

03:20 10 Q. You agree with me that SigmaTel made and sold
03:20 11 semiconductor products?

03:20 12 A. Yes.

03:20 13 Q. But you can't identify and have not identified any
03:20 14 product that SigmaTel ever used a patent in, correct?

03:20 15 A. That's right. I have not investigated that issue.

03:20 16 Q. So the patent issued -- let's take each of the two
03:21 17 patents. The '373 patent issued in 2009, correct?

03:21 18 A. I did not hear that.

03:21 19 Q. I'm sorry. The '373 patent issued in 2009, correct?

03:21 20 A. That's my recollection, yes.

03:21 21 Q. The '759 patent issued in 2010, correct?

03:21 22 A. Yes. I think we discussed that.

03:21 23 Q. So the patents have been around --

03:21 24 A. For about a decade.

03:21 25 Q. So the patents have been around for about a decade,

03:21 1 correct?

03:21 2 A. Yes.

03:21 3 Q. And in that time, as far as you know, none of the
03:21 4 owners of the patents in that entire decade ever made use of it
03:21 5 in a commercial product, correct?

03:21 6 A. I do not know. I'm not an engineer. I don't
03:21 7 determine use or infringement or practicing, so I simply do not
03:21 8 know.

03:21 9 Q. One way or the other?

03:21 10 A. That's right.

03:21 11 Q. Okay.

03:21 12 A. I'm an economist.

03:21 13 Q. So let me ask you to assume that there's been no
03:22 14 evidence that SigmaTel or Freescale or NXP made a product using
03:22 15 either of the two patents. Just make that assumption, okay?

03:22 16 A. Okay.

03:22 17 Q. And I want to take you back to the Tom Brady/Patrick
03:22 18 Mahomes example that you gave, okay?

03:22 19 A. I remember it.

03:22 20 Q. Now, I'm from Boston so I followed the career of
03:22 21 both. Brady was a sixth-round draft choice, correct?

03:22 22 A. Yes.

03:22 23 Q. But by his second year, the Patriots figured out what
03:22 24 they had and they put him in the game, and he won the Super
03:22 25 Bowl, correct?

03:22 1 A. Yes. My recollection is he sat on the bench for the
03:22 2 first year, give or take, and then second year really took off.

03:22 3 Q. So they figured out what they had, they put him in
03:22 4 the game and they won the Super Bowl, correct?

03:22 5 A. That's how I remember it.

03:22 6 Q. No one put the '373 patent into the game, did they?

03:22 7 A. I do not know.

03:22 8 Q. No one put the '759 patent in the game, did they?

03:23 9 A. Well, I mean, aside from Intel and the allegations
03:23 10 here, but I'm assuming you're asking about SigmaTel, Freescale,
03:23 11 NXP.

03:23 12 Q. That's precisely what I'm asking about.

03:23 13 Did the people -- now, the Patriots didn't own Brady, but
03:23 14 they had a contract with Brady. And they figured out what they
03:23 15 had and they put him in the game, right?

03:23 16 A. Yes.

03:23 17 Q. Did the people who owned SigmaTel, Freescale, NXP --
03:23 18 did the people who owned these patents figure out what they had
03:23 19 and put the patents in the game?

03:23 20 A. They may have or they may not have. Earlier you
03:23 21 asked me to assume that they had not. But I don't think the
03:23 22 evaluation of that has been done. It's very difficult to
03:23 23 determine whether or not a patent is being used.

03:23 24 Q. If I could ask my question again. As far as you
03:23 25 know, neither Freescale nor SigmaTel nor NXP put those patents

03:24 1 into the commercial game, correct?

03:24 2 A. As far as I know, to my knowledge, that's correct.

03:24 3 Q. Now, you also can't identify any circumstance where
03:24 4 Freescale licensed either the '373 or the '759 patents,
03:24 5 correct?

03:24 6 A. That's fair.

03:24 7 Q. All right. Now, VLSI acquired these patents in 2018,
03:24 8 as we said earlier, correct?

03:24 9 A. I'm sorry. What year did you say?

03:24 10 Q. 2018.

03:24 11 A. Yes.

03:24 12 Q. And the only thing that VLSI has done with the
03:24 13 patents is sue Intel?

03:24 14 A. My understanding is that there have been efforts to
03:24 15 undertake licensing but that those efforts have been chilled as
03:24 16 a result of this litigation.

03:25 17 Q. Those efforts have been unsuccessful, correct?

03:25 18 A. Thus far, yes.

03:25 19 Q. Now, during the time that VLSI has owned the patents,
03:25 20 it has not used the patents to generate any revenue at all,
03:25 21 correct?

03:25 22 A. I believe they are seeking to.

03:25 23 Q. So the answer to my question is correct, they have
03:25 24 not?

03:25 25 A. It has not been realized.

03:25 1 Q. Right. Now, you talked about the United States
03:25 2 patent system today, and you put Section 284 on the screen for
03:25 3 the jurors. Do you remember that?

03:25 4 A. I do recall the statute, yes.

03:25 5 Q. And were you here or watching the opening arguments,
03:25 6 opening statements?

03:25 7 A. I was doing my best to watch via Zoom, which is kind
03:25 8 of the mechanism in today's day and age.

03:25 9 Q. Sure. You heard Mr. Chu talk about the importance of
03:26 10 the patent system and how it promotes innovation, correct?

03:26 11 A. Yes.

03:26 12 Q. Now, do you agree that the economy and innovation is
03:26 13 harmed when plaintiffs recover unreasonable damages?

03:26 14 A. When those damages are objectively unreasonable, I
03:26 15 would agree.

03:26 16 Q. Yeah. It harms the economy, and it harms innovation,
03:26 17 correct?

03:26 18 A. If the damages are objectively unreasonable, I would
03:26 19 agree.

03:26 20 Q. Now, I'll come to it in more detail a little later,
03:26 21 but have you analyzed the documents by which VLSI acquired
03:26 22 these two patents and others in 2018?

03:26 23 A. I have, I think, seen some documents. I would not
03:27 24 characterize it as analyzed.

03:27 25 Q. But you cited them in your report, correct?

03:27 1 A. I likely did. I cited a lot of documents. Not a
03:27 2 gazillion, but a lot.

03:27 3 Q. Okay. You yourself have never negotiated a
03:27 4 microprocessor patent license for anything like the numbers
03:27 5 that you showed the ladies and gentlemen of the jury on the
03:27 6 screens today, correct?

03:27 7 A. I have participated in negotiations that ultimately
03:27 8 would lead to such numbers. But not like a single upfront
03:27 9 payment.

03:27 10 Q. Okay. Fair enough.

03:27 11 Now, Dr. Sullivan, you heard of the Texas Rangers?

03:27 12 A. In multiple ways, yes.

03:27 13 Q. They're a Major League Baseball team that plays out
03:27 14 of Arlington?

03:27 15 A. That's one of the Texas Rangers I was thinking about.

03:27 16 Q. Just to put the numbers that you've given the jurors
03:28 17 in context, the hypothetical negotiation here was: In what
03:28 18 year?

03:28 19 A. 2011 and '13.

03:28 20 Q. The Texas Rangers were sold in its -- their entirety
03:28 21 in 2010 for \$593 million. Does that sound right to you?

03:28 22 A. I would not dispute that.

03:28 23 Q. Right. And your damages number would be enough to --

03:28 24 MS. PROCTOR: Objection, Your Honor.

03:28 25 THE COURT: I can't hear you.

03:28 1 MS. PROCTOR: Objection, Your Honor. We have a motion in
03:28 2 limine on this. It is also Rule 403.

03:28 3 MR. LEE: I'm not sure what limine motion she's referring
03:28 4 to.

03:28 5 MS. PROCTOR: No. 2, Section 4, Your Honor.

03:28 6 THE COURT: Hang on a second. I'm going to overrule the
03:29 7 objection.

03:29 8 BY MR. LEE:

03:29 9 Q. You've also heard of the Dallas Mavericks?

03:29 10 A. Yes.

03:29 11 Q. An NBA team?

03:29 12 A. That's right.

03:29 13 Q. And you did some work for the NBA Players
03:29 14 Association, correct?

03:29 15 A. Yes.

03:29 16 Q. And in 2015 they were sold in their entirety for
03:29 17 \$1.5 billion, correct?

03:29 18 A. That sounds familiar.

03:29 19 Q. Right. And you yourself have written articles about
03:29 20 the purchase and sale of some professional sports teams,
03:29 21 correct?

03:29 22 A. Yes. The Atlanta Hawks.

03:29 23 Q. You also wrote about the sale of the Los Angeles
03:29 24 Clippers, correct?

03:29 25 A. I -- relatedly. It was in -- well, you'll get to it,

03:30 1 I'm sure, but it was in that context.

03:30 2 Q. And you described the purchase price of the Los
03:30 3 Angeles Clippers as astronomical, correct?

03:30 4 A. Yes. In relation to previous purchases of basketball
03:30 5 teams.

03:30 6 Q. And the number for that sale was \$2 billion, correct?

03:30 7 A. That's right.

03:30 8 Q. Now, let's focus on what you did specifically in
03:30 9 constructing, and I think the word you used was "developing"
03:30 10 your model, okay? I want to turn to that specifically. Can we
03:30 11 do that?

03:30 12 A. I'm happy to talk about my model.

03:30 13 Q. Okay. Now, the hypothetical negotiation, as you told
03:30 14 us, had Freescale on one side, correct?

03:30 15 A. Yes.

03:30 16 Q. The earliest time it would occur would be the first
03:30 17 quarter of 2011, correct?

03:30 18 A. Which quarter did you say?

03:31 19 Q. Fourth quarter of 2011. I may have misspoke, so let
03:31 20 me say it again. The earliest time it would have taken place
03:31 21 would have been the fourth quarter of 2011.

03:31 22 A. I'd have to go back and look if it was third or
03:31 23 fourth, but right around that time period.

03:31 24 Q. Okay. So let's fix ourselves in that time period.
03:31 25 We have Freescale at one side of the table; we have Intel on

03:31 1 the other. And let's take you through the steps specifically
03:31 2 that you used to get to your numbers, okay?

03:31 3 A. Sure.

03:31 4 Q. First, you relied on Dr. Conte to provide you with
03:31 5 patent specific performance and power benefits, correct?

03:31 6 A. I do use his work as inputs.

03:31 7 Q. If Dr. Conte's numbers are incorrect, then your
03:31 8 ultimate numbers are going to be incorrect?

03:32 9 A. It depends upon in which way his numbers are
03:32 10 incorrect. But I'll grant you, if his numbers should be
03:32 11 different, then my numbers would be different. They flow
03:32 12 through and they scale.

03:32 13 Q. And after receiving Dr. Conte's numbers from his
03:32 14 work, you performed a regression, correct?

03:32 15 A. I don't think of it chronologically quite the way you
03:32 16 put it, but I did perform a regression analysis.

03:32 17 Q. All right.

03:32 18 A. Of course.

03:32 19 Q. And then you multiplied your regression analysis by
03:32 20 the inputs from Dr. Conte, correct?

03:32 21 A. Not quite. I took the result, which is a coefficient
03:32 22 from the regression analysis on -- and I multiplied that by the
03:32 23 improvements provided by Dr. Conte.

03:32 24 Q. Okay. So we have the model, the regression model
03:32 25 that you have developed. We have Dr. Conte's inputs, and then

03:33 1 you're using them together, correct?

03:33 2 A. Yes.

03:33 3 Q. And that gives you what you call the price effect,
03:33 4 correct?

03:33 5 A. Using the coefficient multiplied by the benefits --

03:33 6 Q. Right.

03:33 7 A. -- provides a price benefit --

03:33 8 Q. And then you use something called "cost
03:33 9 apportionment," correct?

03:33 10 A. Yes. I used cost apportionment and commercialization
03:33 11 apportionment.

03:33 12 Q. And then you do something called "contribution
03:33 13 apportionment," correct?

03:33 14 A. Contribution or commercialization. I kind of use
03:33 15 those terms somewhat interchangeably, but it is that next
03:33 16 apportionment after profit.

03:33 17 Q. So just so we all understand, your analysis relies
03:33 18 upon numbers provided to you by Dr. Conte, correct?

03:33 19 A. I do use those numbers.

03:33 20 Q. Dr. Conte relies upon numbers that came from
03:33 21 Dr. Annavaram, correct?

03:33 22 A. Yes.

03:33 23 Q. And then you combine the numbers Dr. Conte gave you
03:34 24 with the coefficients from your regression analysis, correct?

03:34 25 A. I do.

03:34 1 Q. And if any of those is wrong, if Dr. Annavaram's data
03:34 2 is wrong or Dr. Conte's data is wrong or the coefficients from
03:34 3 your regression analysis is wrong, then your damages number is
03:34 4 not correct, right?

03:34 5 A. All depends upon in what way they are wrong. Yet
03:34 6 again, I will grant you, if those numbers should be different,
03:34 7 then my number or the reasonable royalty would be different.

03:34 8 Q. If Dr. Annavaram was wrong by a factor of ten
03:34 9 percent, your number would be different, correct?

03:34 10 A. By ten percent.

03:34 11 Q. Right. And if Dr. Conte was wrong by ten percent,
03:34 12 your number would be wrong by ten percent?

03:34 13 A. Again, yeah. It's what would be considered a scaler,
03:35 14 so it scales.

03:35 15 Q. Right. But in any event, each step in the process is
03:35 16 dependent upon a step that occurred before, correct?

03:35 17 A. Well, it's all used together.

03:35 18 Q. Okay. Now, it's true, is it not, that you could not
03:35 19 identify for us any license agreement in the real world that
03:35 20 was negotiated using the process that I've just described,
03:35 21 correct?

03:35 22 A. The general process of identifying technical benefits
03:35 23 multiplying them by a price benefit adjusting for profit and
03:35 24 relative contributions, that's a very common approach.

03:35 25 Q. Tell us, identify by party and name, a single license

03:35 1 agreement anywhere on the face of the Earth that was negotiated
03:35 2 using this process.

03:35 3 A. We both know that's not a fair question because --

03:36 4 Q. Dr. Sullivan --

03:36 5 A. Well, okay. I'll just leave it at that. There's a
03:36 6 reason why that's not a fair question.

03:36 7 THE COURT: Dr. Sullivan, you need to listen to
03:36 8 Mr. Lee's -- you don't get to judge his question. You need to
03:36 9 answer his question with a yes or no or tell him you don't
03:36 10 understand it.

03:36 11 THE WITNESS: Thank you, Your Honor.

03:36 12 BY MR. LEE:

03:36 13 Q. Dr. Sullivan, can you identify for me by name, by
03:36 14 license or by licensee, any license agreement on the face of
03:36 15 the Earth that was ever negotiated using this multistep process
03:36 16 that you and I have just described?

03:36 17 THE COURT: Yes, ma'am.

03:36 18 MS. PROCTOR: I'm going to object on the basis of
03:36 19 confidentiality concerns.

03:36 20 (Clarification by Reporter.)

03:36 21 MS. PROCTOR: Objection on the basis of confidentiality
03:36 22 concerns.

03:36 23 MR. LEE: It's just a yes or no question.

03:36 24 THE COURT: I'll limit it. I'll allow him to answer with
03:36 25 a yes or no. If Mr. Lee wants to -- if the answer is yes, he

03:37 1 can. And -- I will clear the courtroom and allow us to move
03:37 2 forward. If in fact it is, Mr. Lee, if you would then find out
03:37 3 whether or not --

03:37 4 MR. LEE: Fair enough. Yes.

03:37 5 THE COURT: -- if there is a yes, whether the information
03:37 6 he has is or is not confidential.

03:37 7 MR. LEE: Yes.

03:37 8 BY MR. LEE:

03:37 9 Q. Can you answer that yes or no?

03:37 10 A. I am -- now I don't recall which way the question
03:37 11 went, but I am unable to disclose or provide for you a name of
03:37 12 such an agreement.

03:37 13 Q. Okay. So let me be a little bit more specific, and
03:37 14 let me focus on Intel and Freescale. Could we do that?

03:37 15 A. Sure.

03:37 16 Q. You can't identify any instance where Intel
03:37 17 determined an appropriate royalty rate using the multistep
03:37 18 methodology that you used, correct?

03:37 19 A. That's fair.

03:37 20 Q. You cannot identify any instance where Freescale used
03:37 21 the multistep process that you've identified to negotiate a
03:37 22 license, correct?

03:38 23 A. That's right.

03:38 24 Q. You cannot identify any instance where NXP used the
03:38 25 multistep process that you employed to negotiate a license,

03:38 1 correct?

03:38 2 A. That too is correct.

03:38 3 Q. And the same's true for SigmaTel, correct?

03:38 4 A. Yes.

03:38 5 Q. So let's go back to the steps of your process and run
03:38 6 through them quickly. As you told us, you're not an engineer,
03:38 7 so you didn't perform any power testing experiment yourself,
03:38 8 correct?

03:38 9 A. That's right.

03:38 10 Q. And you relied on Dr. Annavaram and Dr. Conte,
03:38 11 correct?

03:38 12 A. Correct.

03:38 13 Q. Now, as you told us, Dr. Conte told you that the '373
03:38 14 patent provides a 5.45 percent power savings benefit in Intel's
03:38 15 Haswell and Broadwell products, correct?

03:38 16 A. Yes.

03:38 17 Q. And he said that the '759 patent provided a
03:39 18 1.11 percent performance benefit in the Lake products, correct?

03:39 19 A. Correct. The accused Lake products.

03:39 20 Q. Right. And you just took those numbers as given to
03:39 21 you, correct?

03:39 22 A. I did use those numbers. That's right.

03:39 23 Q. Did you ever meet with Dr. Annavaram when he
03:39 24 completed his testing to discuss his testing with him?

03:39 25 A. I did have discussions with Dr. Annavaram.

03:39 1 Q. Did you have discussions with him before he conducted
03:39 2 his tests?

03:39 3 A. Not relatedly. No.

03:39 4 Q. Okay. Did you have any discussions with Dr. Conte
03:39 5 before he provided you his numbers?

03:39 6 A. Yes.

03:39 7 Q. All right. And when he provided you his numbers, did
03:39 8 you discuss the numbers with him?

03:39 9 A. As I think of it, yes.

03:40 10 Q. Okay. But as of the time of your deposition, you
03:40 11 couldn't say where Dr. Conte got his performance test results
03:40 12 from, correct?

03:40 13 A. That's fair.

03:40 14 Q. At the time of your deposition, you couldn't say
03:40 15 where Dr. Conte got his '373 power saving numbers from,
03:40 16 correct?

03:40 17 A. That's right. I wasn't speaking on behalf of
03:40 18 Dr. Conte.

03:40 19 Q. Right. Now, let's go to the regression analysis that
03:40 20 you described in your regression model. Okay. Are you with
03:40 21 me?

03:40 22 A. Sure.

03:40 23 Q. Okay. Dr. Sullivan, you're not aware of any
03:40 24 regression analysis ever being used to value the '373 patent,
03:40 25 correct?

03:40 1 A. Well, not aside from this case.

03:40 2 Q. Aside from you in this case and your group at
03:40 3 Intensity who were retained for this case, correct?

03:41 4 A. Correct.

03:41 5 Q. Now, you're also not aware of anyone ever using a
03:41 6 regression analysis to value the '759 patent, correct?

03:41 7 A. Same as with the '373. That's right.

03:41 8 Q. And you're certainly not aware of anybody at
03:41 9 SigmaTel, NXP or Freescale using a regression analysis to value
03:41 10 either of these patents, correct?

03:41 11 A. Correct.

03:41 12 Q. And no one at VLSI did either, correct?

03:41 13 A. As far as I know.

03:41 14 Q. All right. Now, you do know -- as you told me, you
03:41 15 know who Mr. Stolarski is, correct?

03:41 16 A. I do.

03:41 17 Q. The CEO of VLSI, correct?

03:41 18 A. That is my understanding.

03:41 19 Q. And you know that he was a lawyer at Motorola for
03:41 20 22 years, don't you?

03:41 21 A. Sounds familiar.

03:41 22 Q. And Motorola is the company that spun off Freescale,
03:41 23 correct?

03:42 24 A. Yes.

03:42 25 Q. And Mr. Stolarski was involved in negotiating

03:42 1 hundreds of licenses at Motorola, wasn't he?

03:42 2 A. I do not recall.

03:42 3 Q. You know that he was involved in negotiating licenses
03:42 4 at Motorola, correct?

03:42 5 A. That sounds right.

03:42 6 Q. And you know that Mr. Stolarski never personally used
03:42 7 a regression analysis in any one of those negotiations,
03:42 8 correct?

03:42 9 A. That would not surprise me.

03:42 10 Q. And, in fact, he never asked anybody in connection
03:42 11 with any of those license negotiations to conduct a regression
03:42 12 analysis, correct?

03:42 13 A. I could not say one way or the other.

03:42 14 Q. Now, you also reviewed the deposition of Kevin Klein,
03:42 15 K-l-e-i-n, correct?

03:42 16 A. That name sounds familiar, but at the moment I cannot
03:42 17 place it.

03:42 18 Q. Mr. Klein was the director of licensing at Freescale,
03:42 19 correct?

03:42 20 A. I'm going to have to take your word for that one.
03:43 21 I've reviewed far too many depositions in this case.

03:43 22 Q. If it helps you, and you can look at it if you like,
03:43 23 I'll represent to you if you look at Tab 20 in the notebook in
03:43 24 your report, you reviewed the deposition of Mr. Klein.

03:43 25 A. I totally believe you. I just don't have all of

03:43 1 these names committed to memory.

03:43 2 Q. Okay. Mr. Klein was at Freescale, and I will
03:43 3 represent to you that in your report you identify his
03:43 4 deposition as one of the depositions you reviewed in preparing
03:43 5 your opinions, okay?

03:43 6 A. Sounds great.

03:43 7 Q. And Mr. Klein couldn't identify a single instance
03:43 8 where Freescale used a regression analysis in a patent license
03:43 9 negotiation, correct?

03:43 10 A. I do not recall that, but that may be the case.

03:43 11 Q. Any reason to disagree?

03:43 12 A. No.

03:43 13 Q. Okay. You also reviewed the deposition of someone
03:43 14 called Aaron Waxler. Do you recall that?

03:44 15 A. I do.

03:44 16 Q. And Mr. Waxler now was at NXP, correct?

03:44 17 A. I'm sorry. I'm not quite following the time. Are
03:44 18 you saying he is now but wasn't --

03:44 19 Q. No. He was at the time of his deposition the vice
03:44 20 president of IP licensing at NXP, correct?

03:44 21 A. I do not recall his title, but I do recall him doing
03:44 22 licensing at NXP.

03:44 23 Q. And, in fact, you know from having read his
03:44 24 deposition that there's a whole group of folks at NXP who do
03:44 25 nothing other than license patents, correct?

03:44 1 A. They do have a licensing group. That's my
03:44 2 understanding.

03:44 3 Q. And it's not a small group, is it?

03:44 4 A. I don't recall the size.

03:44 5 Q. Now, you know from your review that Mr. Waxler
03:44 6 testified that no one at NXP has ever used a regression
03:44 7 analysis to value patents or negotiate a license agreement,
03:44 8 correct?

03:44 9 A. I do not have that recollection, but that may be the
03:45 10 case.

03:45 11 Q. Do you have any reason to disagree with me?

03:45 12 A. No.

03:45 13 Q. Okay. You also reviewed the deposition of James
03:45 14 Kovacs, correct?

03:45 15 A. Yes.

03:45 16 Q. Now, Mr. Kovacs is the director of licensing
03:45 17 trademarks and standards at Intel, correct?

03:45 18 A. Yes.

03:45 19 Q. And he testified that in all his time at Intel, no
03:45 20 one has ever used a regression analysis to negotiate a license
03:45 21 agreement, correct?

03:45 22 A. That does sound familiar.

03:45 23 Q. Now, in your regression analysis -- let's turn to
03:45 24 your regression analysis. We heard that VLSI's accusing
03:45 25 certain Intel products that you described earlier today,

03:45 1 correct?

03:45 2 A. I did not hear that. Just try again.

03:45 3 Q. Sure. Intel has accused certain Skylake products and
03:45 4 certain Broadwell and Haswell products of infringing these two
03:45 5 patents, correct?

03:45 6 A. Yes. Lake products and well products.

03:46 7 Q. Okay. And now, in your regression model, I think you
03:46 8 explained to the jurors that you included both accused features
03:46 9 and nonaccused features, correct?

03:46 10 A. I did, yeah. I don't think that's the question you
03:46 11 intended to ask.

03:46 12 Q. But you did include both features accused of
03:46 13 infringement and other features not accused of infringement,
03:46 14 correct?

03:46 15 A. Yes.

03:46 16 Q. And, in fact, it was your belief that it was
03:46 17 impossible to perform your regression model only on accused
03:46 18 products, correct?

03:46 19 A. It would not be feasible to run the regression on
03:46 20 only accused products to be able to determine what the valid
03:46 21 price effect is associated with the technology.

03:46 22 Q. So the answer is it would not be feasible to use your
03:46 23 regression model and include only accused products, correct?

03:47 24 A. That would not be my model. That's correct.

03:47 25 Q. Now, let me focus you on the '373 patent. You never

03:47 1 performed your regression on just the accused Haswell and
03:47 2 Broadwell products, did you?

03:47 3 A. No. That would not be proper.

03:47 4 Q. And for the Lake products, you never performed a
03:47 5 regression just on the products accused of infringing the '759?

03:47 6 A. Similarly, no. I did not.

03:47 7 Q. And you never performed an analysis showing what the
03:47 8 impact was of nonaccused products on your regression analysis,
03:47 9 correct?

03:47 10 A. That would not be valid.

03:47 11 Q. And just so I'm clear with you on the terminology,
03:47 12 there are accused products and nonaccused products, correct?

03:47 13 A. Yes.

03:47 14 Q. And if I go to the first category of accused
03:47 15 products, within the accused products, there are accused
03:48 16 features and nonaccused features, correct?

03:48 17 A. In effect, yes.

03:48 18 Q. And so within the products accused of infringing,
03:48 19 there are many features that are not accused of infringing the
03:48 20 '373 or '759 patent, correct?

03:48 21 A. That's right.

03:48 22 Q. And can we refer to them as nonaccused features?

03:48 23 A. If you'd like. I think of it more as features and
03:48 24 characteristics and functionalities.

03:48 25 Q. Okay. So I'm going to talk about nonaccused

03:48 1 features. Intel's microprocessors have many nonaccused
03:48 2 features that contribute to performance, correct?

03:48 3 A. I would agree.

03:48 4 Q. Intel's microprocessors have many nonaccused features
03:48 5 that contribute power savings, correct?

03:48 6 A. I would agree with that too.

03:49 7 Q. Now, when you did your regression analysis, you
03:49 8 actually prepared a table at H. -- H.1 of your report.

03:49 9 MR. LEE: And actually, Your Honor, I don't know when you
03:49 10 wanted to take a break, but I'm about to go into this report,
03:49 11 if this is the right time.

03:49 12 Why don't we -- why don't we keep going?

03:49 13 BY MR. LEE:

03:49 14 Q. Turn in your binder to Tab 24.

03:49 15 Now, I'm going to ask you to go to attachment H.1A. And
03:49 16 I'm only going to put it up on the jurors' screens, the Court
03:49 17 and counsel because VLSI has designated it confidential.

03:49 18 MS. PROCTOR: We're -- objection to this being shown.

03:49 19 THE COURT: I can't hear you.

03:49 20 MS. PROCTOR: I'm just objecting to this being shown on
03:50 21 the screens at this point in the examination.

03:50 22 THE COURT: I can't hear you.

03:50 23 MS. PROCTOR: Your Honor, I apologize. I object to this
03:50 24 being shown at this point in the examination on the screens.

03:50 25 MR. LEE: It's the schedule from his report, Your Honor.

03:50 1 THE COURT: Well, we can limit it. I assume your concern
03:50 2 is that anyone see it beyond the jury, correct?

03:50 3 MS. PROCTOR: Well, I guess it depends what he's going to
03:50 4 ask, Your Honor, but that he -- yes, that anyone else see it
03:50 5 and also that it be shown to the jury.

03:50 6 THE COURT: That he not show it to the jury?

03:50 7 MS. PROCTOR: Well, I'll let him ask the question, Your
03:50 8 Honor. Based on -- I want to hear the question he's going to
03:50 9 ask before he shows it to the jury, Your Honor. I apologize.

03:50 10 THE COURT: Well, let's not show it to anybody until we
03:50 11 hear the question, and then if we show it to anyone, we'll
03:50 12 limit it to the jury.

03:50 13 BY MR. LEE:

03:50 14 Q. Now, turn, if you would, to Tab 24 in your binder.
03:51 15 Do you have that?

03:51 16 A. Yes. I'm there.

03:51 17 Q. Do you find a copy of attachment H.1 A from your
03:51 18 expert report?

03:51 19 A. Correct.

03:51 20 Q. Do you recognize it?

03:51 21 A. As a matter of fact, I do.

03:51 22 Q. And that is one of the schedules that you attached to
03:51 23 your report, correct?

03:51 24 A. Yes. It's one of the tables.

03:51 25 Q. Now, here, Your Honor, I would ask now to put it up

03:51 1 on the jurors' screens and counsels' screen but not the public
03:51 2 screen.

03:51 3 THE COURT: Okay. Yes, sir.

03:51 4 MS. PROCTOR: That's fine, Your Honor.

03:51 5 MR. LEE: That's fine.

03:51 6 BY MR. LEE:

03:51 7 Q. Do you have it before you?

03:51 8 A. Yes. I do.

03:51 9 Q. All right. Now, this is entitled "ARK Variable
03:51 10 Selection for Modeling," correct?

03:51 11 A. Yes.

03:51 12 Q. ARK is the Intel website that lists specification for
03:52 13 Intel products as you've told us before, correct?

03:52 14 A. That's right.

03:52 15 Q. So if the jurors look at the second column, it says,
03:52 16 "ARK Feature Name," correct?

03:52 17 A. Yes.

03:52 18 Q. And the -- as you've told us, the variables that you
03:52 19 use in your regression are based on the features listed on the
03:52 20 ARK website, correct?

03:52 21 A. That's right.

03:52 22 Q. And you compiled a list of the features from ARK, and
03:52 23 you then included some of them, and you excluded some of them
03:52 24 from your regression, correct?

03:52 25 A. That's right.

03:52 1 Q. Now, if we look at the column all the way to the
03:52 2 right that says "Variable Considered," do you see that?

03:52 3 A. I do.

03:52 4 Q. This refers to whether the variable was considered or
03:52 5 not considered in your regression analysis, correct?

03:52 6 A. No.

03:52 7 Q. Well, when it says Variable Considered, when you say
03:53 8 yes, you included data for that variable, correct?

03:53 9 A. This is part of the initial review of the data. This
03:53 10 isn't the data that determines what factors go into the model.
03:53 11 This is a summary of the data.

03:53 12 Q. Well, let me see what you said at your deposition.
03:53 13 Tab 1 of your binder, day one of your deposition, Page 195,
03:53 14 Lines 3 to 10, and we can bring it up on the screen if it's
03:53 15 easier for you, Dr. Sullivan.

03:53 16 A. I'm also there, so either way.

03:53 17 MS. PROCTOR: Mr. Lee, can you repeat -- Mr. Lee, can you
03:53 18 repeat the page, please?

03:53 19 MR. LEE: Yes. 195, Lines 3 to 10.

03:53 20 BY MS. LEE:

03:53 21 Q. Are you with me?

03:53 22 A. Yes, I'm there.

03:53 23 Q. Question: "And when you list yes in that column,
03:54 24 that means you use that feature in your regression model,
03:54 25 correct?"

03:54 1 Answer: "It means I include data for that variable.
03:54 2 Although ARK often refers to these items and features, some of
03:54 3 them really are more like characteristics for other types of
03:54 4 reporting items. They are not actually all features."

03:54 5 That was your answer, correct?

03:54 6 A. Yes. That's right.

03:54 7 Q. And you stand by it?

03:54 8 A. I do.

03:54 9 Q. And when you say "no," that means that you do not
03:54 10 include data for that variable in your regression model,
03:54 11 correct?

03:54 12 A. Well, in effect, it's whether it's ultimately
03:54 13 included, I think, is a better way to put it. I think it's
03:54 14 fair to say "considered."

03:54 15 Q. So whether it's ultimately considered, if it's no, it
03:54 16 means that it was ultimately not considered, correct?

03:54 17 A. No. I would not put it that way. I would put it the
03:55 18 way I did a moment ago.

03:55 19 Q. Well, let's see what you said in your deposition.
03:55 20 Again, Page 195, Line 24 to 196, Line 5. It's right after what
03:55 21 we just talked about a few minutes ago.

03:55 22 "When you list 'no' in that column titled 'Variable
03:55 23 Considered,' that means you did not include the variable in the
03:55 24 regression model, correct?"

03:55 25 Answer: "That is generally the intention," correct?

03:55 1 A. Exactly.

03:55 2 Q. Now, if I look at the table that was before you and I
03:55 3 count up the yeses, there are 39 of them. Does that sound
03:55 4 about right to you?

03:55 5 A. It should be about that number.

03:55 6 Q. Okay. Now, we heard that Dr. Conte accuses Intel
03:55 7 Speed Shift of infringing the '759 patent, correct?

03:56 8 A. My understanding is that the '759 patent does
03:56 9 implicate Speed Shift, yeah.

03:56 10 Q. You were here for Dr. Conte's testimony yesterday,
03:56 11 were you not?

03:56 12 A. No. I was not. I was listening via Zoom.

03:56 13 Q. Speed Shift is listed in your attachment H.1A at Page
03:56 14 2, correct?

03:56 15 A. It should be on the list. I just don't know on what
03:56 16 page.

03:56 17 Q. We're highlighting it on the list. You have no doubt
03:56 18 that Speed Shift is what Dr. Conte accuses of infringement,
03:56 19 correct?

03:56 20 A. That's the product that's accused, but the feature
03:56 21 that's implicated is the Speed Shift technology, as I
03:56 22 understand it.

03:56 23 Q. And the --

03:56 24 A. And yes. It is on Page 2.

03:56 25 Q. Fair enough.

03:56 1 And the entry on your chart for whether Speed Shift was
03:56 2 considered in your analysis was no, correct?

03:56 3 A. It was not included.

03:57 4 Q. Right. And you talked about a little bit of it on
03:57 5 your direct earlier today, correct?

03:57 6 A. Yes. I explained why.

03:57 7 Q. But the one thing we can agree upon is the accused
03:57 8 feature, Speed Shift, was not considered in your analysis,
03:57 9 correct?

03:57 10 A. Well, I considered it. That's why it's listed here.
03:57 11 But it was not included in the regression model.

03:57 12 Q. Okay. Fair enough. So you considered it, but you
03:57 13 didn't include it, correct?

03:57 14 A. In the model. That's right.

03:57 15 Q. So let's look at a few things that you did include in
03:57 16 your model. There's something called hyperthreading
03:57 17 technology.

03:57 18 MR. LEE: Can we highlight that?

03:57 19 BY MR. LEE:

03:57 20 Q. Do you see that, Dr. Sullivan?

03:57 21 A. Yes.

03:57 22 Q. Hyperthreading technology is not accused of
03:57 23 infringing the -- either of the two patents, correct?

03:58 24 A. As far as I know, that's not implicated. But I --
03:58 25 again, I'm approaching this not as an engineer --

03:58 1 Q. Okay. But as far as you know, it's not been accused
03:58 2 of infringing, correct?

03:58 3 A. Well, the product is. And hyperthreading's in the
03:58 4 product.

03:58 5 Q. Is the feature accused of infringing?

03:58 6 A. That's not my understanding.

03:58 7 Q. Now, there's also Intel's Identity Protection
03:58 8 Technology. Do you see that?

03:58 9 A. Yes.

03:58 10 Q. And you know that identity protection technology,
03:58 11 particularly today, is important technology, correct?

03:58 12 A. There are security aspects that are important. And
03:58 13 it's, you know, debatable whether this is playing an important
03:58 14 role for customers or not.

03:58 15 Q. And that was considered and included in your
03:58 16 analysis, correct?

03:59 17 A. Yes. I do.

03:59 18 Q. But no one accuses that feature of infringing either
03:59 19 of the patents, correct?

03:59 20 A. That's my understanding.

03:59 21 Q. You also considered Intel's Trusted Execution
03:59 22 Technology, correct?

03:59 23 A. Yes. That too is a security feature.

03:59 24 Q. And security features are really important today, are
03:59 25 they not?

03:59 1 A. Generally, they can be. The role depends upon --

03:59 2 Q. And you included -- I'm sorry. I didn't mean to stop
03:59 3 you.

03:59 4 A. Nothing. I'm good.

03:59 5 Q. And you included this feature. You considered this
03:59 6 feature and included it in your regression analysis, correct?

03:59 7 A. Yes.

03:59 8 Q. But it's not accused of infringing either patent,
03:59 9 correct?

03:59 10 A. That is my understanding.

03:59 11 Q. Okay.

03:59 12 MR. LEE: Your Honor, is it a good time to take the
03:59 13 afternoon break?

03:59 14 THE COURT: Do you have more?

03:59 15 MR. LEE: I have a little bit more, and I asked to use a
03:59 16 break to basically fix what I need to do.

03:59 17 THE COURT: Absolutely. I'm sure no one on the jury is
04:00 18 opposed to us taking a break. And so -- and if they are,
04:00 19 they're not going to admit it in front of the other jurors.

04:00 20 So if you all would remember my instructions not to
04:00 21 discuss the case amongst yourselves.

04:00 22 Did you have a particular need? Is ten minutes enough,
04:00 23 Mr. Lee?

04:00 24 MR. LEE: Pardon, Your Honor?

04:00 25 THE COURT: Is ten minutes enough?

04:00 1 MR. LEE: Ten minutes is great.

04:00 2 THE BAILIFF: All rise.

04:00 3 (Jury exited the courtroom at 4:00.)

04:00 4 THE COURT: Mr. Lee, is there something you needed take
04:00 5 up?

04:00 6 MR. LEE: No, no. I just thought it seemed like the right
04:00 7 time.

04:00 8 THE COURT: Oh. And anyone can be seated who wants to.
04:00 9 I'm just tired of sitting.

04:00 10 I anticipate -- how -- are you almost done with -- I don't
04:00 11 care. Just trying to figure out the rest of the day.

04:01 12 MR. LEE: I think probably 20 minutes and I'll be done.

04:01 13 THE COURT: Redirect?

04:01 14 MS. PROCTOR: Yes, Your Honor.

04:01 15 THE COURT: I know the "yes."

04:01 16 (Laughter.)

04:01 17 THE COURT: I was hoping for an amount of time.

04:01 18 MS. PROCTOR: Hard to say. Maybe ten to 15 minutes, Your
04:01 19 Honor, depending on how things go.

04:01 20 THE COURT: It sounds to me like we'll be close to
04:01 21 5 o'clock.

04:01 22 Now, the question is whether or not you all wanted to
04:01 23 start your -- I'll leave this up to you, because -- Mr. Lee,
04:01 24 because if your witness wants to go today and we can get him
04:01 25 out of the way, and I think you said in under an hour, I'm

04:01 1 happy to do that. I'm also happy to break at 5:00.

04:01 2 MR. LEE: Your Honor, I guess the question I have is --

04:01 3 THE COURT: Oh. I know we've still got -- they've still
04:01 4 got depositions.

04:01 5 MR. LEE: They have depositions, and they have -- so
04:01 6 before I think we would want them to rest.

04:01 7 THE COURT: Absolutely. You'd think I'd never been in a
04:02 8 trial. I'm sorry. I forgot that there's more to come.

04:02 9 So what we'll do is this. Where do the -- does
04:02 10 plaintiff's counsel have any -- is Dr. Sullivan the last
04:02 11 witness?

04:02 12 MS. PROCTOR: Yes, Your Honor.

04:02 13 THE COURT: Okay. So do you all have depositions ready to
04:02 14 go today, or would it be easier for you if we started in the
04:02 15 morning? I'll do whatever.

04:02 16 MS. PROCTOR: I believe we do have some plays ready to go
04:02 17 today.

04:02 18 (Conference between counsel.)

04:02 19 MR. HEINRICH: I think it's going to be easier to do it in
04:02 20 the morning.

04:02 21 THE COURT: Mr. Lee, are you okay with that?

04:02 22 MR. LEE: That's fine with us, Your Honor.

04:02 23 THE COURT: Okay. So here's what -- we'll finish with
04:02 24 Dr. Sullivan whenever that happens. Then you'll have the rest
04:02 25 of the evening to just take off and have a cozy fun evening.

04:02 1 MR. LEE: Actually, for those of us from Boston, to enjoy
04:02 2 the weather is what we'll do.

04:02 3 THE COURT: And then in the morning we'll start with --
04:02 4 the depositions will be ready to go. But I haven't seen any
04:03 5 deposition designations. If there are -- if you all are
04:03 6 expecting me to rule on objections to depositions, I don't
04:03 7 think -- if you've given them to my clerks, I haven't seen
04:03 8 them.

04:03 9 MS. PROCTOR: We will submit those to you if there are any
04:03 10 remaining objections after tonight, Your Honor.

04:03 11 THE COURT: Okay. I would encourage you -- I would
04:03 12 strongly encourage you -- it is highly unlikely I will sustain
04:03 13 any objections in a deposition unless it was something very
04:03 14 substantive. You know, something -- in other words, something
04:03 15 I would sustain if the person were here.

04:03 16 I get a lot of irrelevant, duplicative, all that. You can
04:03 17 presume I would not sustain those objections in either
04:03 18 direction of any deposition. But if there's something in the
04:03 19 deposition that you really believe was inappropriate and the
04:03 20 jury shouldn't get to hear it, let me know and we can take that
04:04 21 up in the morning and I'll rule on that. Otherwise, you should
04:04 22 plan on just playing the depositions.

04:04 23 MS. PROCTOR: Yes, sir.

04:04 24 THE COURT: And then how long do we have on depositions?

04:04 25 MS. PROCTOR: It'll be relatively short, Your Honor.

04:04 1 Maybe half an hour at the most, I think.

04:04 2 THE COURT: Okay. Then we'll have -- I'll take up your
04:04 3 motions. And then you should have your witnesses prepared to
04:04 4 go.

04:04 5 MR. LEE: And our plan was, Your Honor, to make the
04:04 6 motions briefly and then file something in writing to amplify
04:04 7 them.

04:04 8 THE COURT: That's absolutely fine.

04:04 9 MR. LEE: Thank you, Your Honor.

04:04 10 THE COURT: Okay. We'll come back in just a few minutes.

04:04 11 (Recess taken from 4:04 to 4:14.)

04:14 12 THE BAILIFF: All rise.

04:14 13 THE COURT: Please remain standing for the jury.

04:15 14 (The jury entered the courtroom at 4:14.)

04:15 15 THE COURT: Thank you. You may be seated.

04:15 16 Mr. Lee, you may resume.

04:15 17 MR. LEE: Thank you, Your Honor.

04:15 18 (Off-the-record discussion.)

04:15 19 THE COURT: Mr. Lee, now that we have a witness back, you
04:15 20 may proceed.

04:15 21 (Laughter.)

04:15 22 MR. LEE: I will, Your Honor.

04:15 23 BY MR. LEE:

04:15 24 Q. All set, Dr. Sullivan? All set?

04:15 25 A. Oh, yes.

04:15 1 Q. Okay. Now, Dr. Sullivan, I want to go back to your
04:16 2 model and the point in which you multiplied the regression
04:16 3 coefficients by the data that Dr. Conte gave you. Do you
04:16 4 recall that?

04:16 5 A. Yes. The coefficient for clock speed.

04:16 6 Q. Yes. Now, Dr. Conte's tests for the '373 patent
04:16 7 measured power savings provided by the patent, correct?

04:16 8 A. Yes.

04:16 9 Q. And Dr. Conte's tests for the '759 patent measured --
04:16 10 or claimed to measure performance improvement provided by the
04:16 11 patent, correct?

04:16 12 A. Yes.

04:16 13 Q. But the regression model you used determines the
04:16 14 specific relationship between price and frequency, correct?

04:16 15 A. Yes. That's right.

04:16 16 Q. Your regression model does not determine the
04:16 17 relationship between price and power savings, correct?

04:17 18 A. It measures the benefit but not those separately.

04:17 19 Q. Right. There's no separate variable in your
04:17 20 regression analysis for a performance benchmark, correct?

04:17 21 A. That's right.

04:17 22 Q. And so in your damages model, you assume that a
04:17 23 1 percent increase in power savings is valued as a 1 percent
04:17 24 increase in frequency, correct?

04:17 25 A. That's right. And that's a minimum threshold.

04:17 1 Q. Right. And you assume that a 1 percent increase in
04:17 2 performance is valued as the same as a 1 percent increase in
04:17 3 frequency, correct?

04:17 4 A. At least as much. That's right.

04:17 5 Q. And you rely upon Dr. Conte for those assumptions,
04:17 6 correct?

04:17 7 A. I do. I mean, as a matter of economics and economic
04:17 8 principles, I rely upon that as well.

04:17 9 Q. Well, do you know if there's any relationship among,
04:18 10 for instance, frequency and voltage and speed?

04:18 11 A. Yes.

04:18 12 Q. Okay. And is there a 1:1 relationship?

04:18 13 A. Not as I understand it from an engineering
04:18 14 perspective. That's why I approached this as an economist.

04:18 15 Q. But the assumption of 1:1 came from Dr. Conte,
04:18 16 correct?

04:18 17 A. He provided support for that notion, yes.

04:18 18 Q. Okay. Now, I want to move to a different subject
04:18 19 which is the acquisition of patents by VLSI, in particular the
04:18 20 acquisition of the two patents in this case, okay?

04:18 21 A. Okay.

04:18 22 Q. Now, if you turn to Volume 1, Tab 7. And let me ask
04:19 23 it this way first, Dr. Sullivan. In preparing your lengthy
04:19 24 report, you reviewed some of the documents by which VLSI
04:19 25 acquired patents from NXP, correct?

04:19 1 A. I do recall a couple of documents in that regard.

04:19 2 Q. Sure. And if you turn to Volume 1, Tab 7, you'll
04:19 3 find a patent purchase and cooperation agreement. Do you see
04:19 4 it?

04:19 5 A. Yes, I do.

04:19 6 Q. This is Defendant's Exhibit 40. And if it helps --
04:19 7 don't put it on the screen quite yet. And if it helps, it is
04:19 8 cited in your expert report at Paragraph 17, Footnote 7.

04:20 9 A. That sounds right.

04:20 10 Q. Okay. Now, let's put D-40 on the screen, but not for
04:20 11 the public, just for the members of the jury, the Court and
04:20 12 counsel.

04:20 13 MS. PROCTOR: And, Your Honor, I want to preserve
04:20 14 objections to any use of other sections of this that are not
04:20 15 cited in the report or the use of it for other purposes.

04:20 16 THE COURT: Let's wait and see what Mr. Lee does. And if
04:20 17 he does something you're unhappy with, make an objection.

04:20 18 BY MR. LEE:

04:20 19 Q. The agreement is dated June 30, 2016, correct?

04:20 20 A. Yes.

04:20 21 Q. And having reviewed the document, you know that VLSI
04:20 22 purchased from NXP a number of patent families, correct?

04:20 23 A. That is my recollection.

04:20 24 Q. In fact, if you turn to Exhibit A, Page 37, there's a
04:21 25 list of patent families, correct? Over the next several pages.

04:21 1 A. Yes.

04:21 2 Q. I've counted them up. There are 21. Do you have any
04:21 3 reason to disagree?

04:21 4 A. No. I have not done that count, but I'll take your
04:21 5 word for it.

04:21 6 Q. But you know from your own review the '373 and '759
04:21 7 patents were not included on this list, correct?

04:21 8 A. That sounds familiar.

04:21 9 Q. Turn if you would to Volume 1, Tab 8 in your
04:21 10 notebook. And do you find Defendant's Exhibit -- or D-119?

04:22 11 A. Yes.

04:22 12 Q. This is an amendment to the purchase agreement
04:22 13 between VLSI and NXP, correct?

04:22 14 A. That's my understanding.

04:22 15 Q. And you reviewed this as well and referred to it at
04:22 16 the same place in your report, correct?

04:22 17 A. Yes.

04:22 18 Q. And it's dated December 2017, correct?

04:22 19 A. Yes. December 4th.

04:22 20 Q. And this agreement identifies more patents that VLSI
04:22 21 has purchased from NXP, correct?

04:22 22 A. I do not recall the specifics.

04:22 23 Q. Turn, if you would, to Annex C, which is at Page 32.

04:22 24 A. I see that.

04:22 25 Q. And if you go from Annex C to Annex D, you will see

04:23 1 the patents that had been previously selected and patents that
04:23 2 were being selected now.

04:23 3 A. I see the headings.

04:23 4 Q. And I've counted them up and there are 137 patent
04:23 5 families that are being acquired at this moment in time. Any
04:23 6 reason to disagree?

04:23 7 A. I'm not sure that's right. I would have to go back
04:23 8 and review. I have not thought about this agreement in the way
04:23 9 you're asking.

04:23 10 Q. Now, the '373 patent is not included on that list,
04:23 11 correct?

04:23 12 A. Which list?

04:23 13 Q. The two lists, Annex C and Annex D.

04:23 14 A. I can take your word for it, or I can take a look
04:24 15 through here.

04:24 16 Q. Well, do you know of the precise agreement that
04:24 17 resulted in the purchase of the '373 and '759 agreement?

04:24 18 A. I'm sorry. I did not follow.

04:24 19 Q. All right. Do you know which agreement between NXP
04:24 20 and VLSI resulted in the purchase of the '373 patent and the
04:24 21 '759 patent?

04:24 22 A. Not sitting here at the moment.

04:24 23 Q. All right. Now, but you have reviewed this
04:24 24 agreement, as you said in your report, correct?

04:24 25 A. Yes. That's why I had a report.

04:24 1 Q. And if I go to Page 4, Section 1(n), there is the
04:24 2 amount that's being paid. Now, we can agree that the patents
04:24 3 that are being sold are on Annex C and Annex D, correct?

04:25 4 A. No. I mean, I can take your word for it, but I have
04:25 5 not --

04:25 6 Q. I'll represent to you that Mr. Stolarski has
04:25 7 testified that those are the patents that were transferred.

04:25 8 A. Okay.

04:25 9 Q. And the price for all of those patent families, which
04:25 10 as I said -- I suggested were about 100-plus, was the number
04:25 11 that I'm going to highlight now. I'm not going to say the word
04:25 12 because the jurors will have this back in the jury room, this
04:25 13 actual document.

04:25 14 So for multiple patents from NXP sold to VLSI and multiple
04:25 15 patent families, the price was the number that's on the screen
04:25 16 right now in this exhibit, correct?

04:25 17 A. My recollection is that is a partial payment or a
04:26 18 partial price.

04:26 19 Q. You think that that is the partial -- how much more
04:26 20 was paid?

04:26 21 A. If I recall -- and again, I haven't looked at this
04:26 22 recently, but if I recall the agreement and transaction is
04:26 23 structured in part is an upfront payment and part as a share of
04:26 24 future royalties.

04:26 25 Q. Sure. How much have they gotten in future royalties?

04:26 1 A. Thus far, I believe that number is zero, but of
04:26 2 course that number could be different from zero.

04:26 3 Q. Right. The amount that has actually been paid by
04:26 4 VLSI to NXP for all of these patent families in this actual
04:26 5 transaction is the number on the screen right now, correct?

04:26 6 A. I could not verify the exact amounts for you.

04:26 7 Q. And you don't know of an additional penny that's been
04:26 8 paid beyond that, correct?

04:27 9 A. I have not performed such an audit. I'm not
04:27 10 disputing. I'm just -- I can't validate.

04:27 11 Q. Okay. Well, let's turn if we could to Tab 9 of your
04:27 12 binder to PTX-4267.

04:27 13 A. I'm sorry. Which tab?

04:27 14 Q. Tab 9 of your binder. Do you have that before you,
04:27 15 Dr. Sullivan?

04:27 16 A. Yes.

04:27 17 Q. This is Amendment 2 to the patent purchase agreement
04:27 18 between VLSI and NXP, correct?

04:27 19 A. Yes.

04:27 20 Q. And again, this is a document that you reviewed,
04:27 21 correct?

04:27 22 A. This is not immediately looking familiar, but that
04:27 23 doesn't mean I have not reviewed it.

04:27 24 Q. Well, I'll represent to you that in your
04:27 25 Attachment A-3a, at Page 31, you refer specifically to this

04:28 1 document.

04:28 2 A. Okay. I'll take your word for it.

04:28 3 Q. Okay. Now, it's on the screen now. It's PTX-4267.

04:28 4 You do know that this is the agreement under which VLSI finally
04:28 5 bought the '373 and '759 patents, correct?

04:28 6 A. I do not have that personal knowledge. I'll take
04:28 7 your word for it.

04:28 8 Q. Well, and you reviewed Mr. Stolarski's deposition?

04:28 9 A. I have looked at parts of that. Yes.

04:28 10 Q. And you know that he testified that this was the
04:28 11 amendment that led to the sale of these two patents to VLSI,
04:28 12 correct?

04:28 13 A. He may have.

04:28 14 Q. Now, the agreement was entered into in December of
04:28 15 2018, correct?

04:28 16 A. I see that here.

04:28 17 Q. Four months later this lawsuit was filed, correct?

04:28 18 A. Roughly.

04:28 19 Q. Okay. Now, just to be sure, if you turn to
04:29 20 Exhibit D-44 at Tab 10 of your binder. Do you have that before
04:29 21 you?

04:29 22 A. Yes.

04:29 23 Q. Exhibit D-44 is a list showing the third set of
04:29 24 patents that VLSI bought from NXP, correct?

04:29 25 A. I do not know.

04:29 1 Q. Well, if we -- you see the specific reference to
04:29 2 Amendment No. 2, which you in fact reviewed, correct?

04:29 3 A. I do not recall Amendment No. 2. I may have reviewed
04:29 4 it or seen it. I just don't recall it.

04:29 5 Q. This is the page of your report that I specifically
04:29 6 referred you to, where you referred to this document by Bates
04:29 7 number. Do you recall that just a few minutes ago?

04:29 8 A. So you referenced Attachment A-3a to my report, which
04:30 9 is a list of all documents that I had access to for
04:30 10 consideration. That's not a set of documents that's
04:30 11 demonstrating I have reviewed all those documents.

04:30 12 Q. Oh, so you had access to them, but you didn't review
04:30 13 all of them?

04:30 14 A. I did my best to consider as much information as I
04:30 15 could, but I am human and I did not read every document from
04:30 16 cover to cover.

04:30 17 Q. Well, let's look at D-44 to see if it refreshes your
04:30 18 recollection that in fact this is the time when the '759 and
04:30 19 '373 patent were transferred.

04:30 20 MR. LEE: At Page 2, could I have on the screen D-44?
04:30 21 BY MR. LEE:

04:30 22 Q. So we're now near the end of 2018. Do you have the
04:30 23 time frame in mind?

04:30 24 A. I have that time frame.

04:30 25 Q. And of the patents that VLSI purchased from NXP, one

04:30 1 of them is listed -- one of them that is listed is the '759
04:31 2 patent, correct?

04:31 3 Do you see it highlighted?

04:31 4 A. Yes. I see that.

04:31 5 Q. And if we go down to Page 5, we see that one of the
04:31 6 other patents that has been selected is '373, correct?

04:31 7 A. I see that listed.

04:31 8 Q. And there are a number of other patents and patent
04:31 9 families listed, correct?

04:31 10 A. Yes.

04:31 11 Q. By my count, there are 18 patent families in total.
04:31 12 Does that seem about right to you?

04:31 13 A. I have not counted them, but I'll take your word for
04:31 14 it.

04:31 15 Q. So let's go back to PTX-4267 and put it back on the
04:31 16 screen?

04:32 17 MR. LEE: Not for the public, Your Honor. Just for the
04:32 18 jurors, the Court and counsel.

04:32 19 BY MR. LEE:

04:32 20 Q. And I'm going to go to Page 7, and I want to focus on
04:32 21 what in 2018 VLSI paid to NXP for the two patents in the case
04:32 22 plus 16 other patent families.

04:32 23 I'm putting on the screen now Paragraph 1(a). Do you see
04:32 24 it?

04:32 25 A. Yes. I see it.

04:32 1 Q. Okay. And if we go down to what's being paid for
04:32 2 this purchase, it's in 1(a)(ii), and I'm now highlighting the
04:32 3 number that is being paid by VLSI to NXP for these two patents
04:33 4 plus others, correct?

04:33 5 A. Well, I'm not so sure about that. As I mentioned
04:33 6 earlier, there's -- the way the transaction, as I understand
04:33 7 it, is arranged is for certain initial payments to be made plus
04:33 8 a partnership. I think they call it a cooperation agreement,
04:33 9 whereby then there are other payments that are made to NXP as
04:33 10 well.

04:33 11 Q. Well, you reviewed the Chastain deposition, did you
04:33 12 not?

04:33 13 A. Yes. I have --

04:33 14 Q. And you know that --

04:33 15 A. -- reviewed pieces of that.

04:33 16 Q. You know that Chastain testified that the total price
04:33 17 of the agreement is the number that I've highlighted here,
04:33 18 correct?

04:33 19 A. I could not validate that for you.

04:33 20 Q. You don't know one way or another?

04:33 21 A. I do not have somebody else's deposition committed to
04:33 22 memory.

04:33 23 Q. I'm just asking about a deposition you reviewed.

04:34 24 Do you recall that from reviewing that deposition, that
04:34 25 the deponent, Chastain, was very specific about the amount that

04:34 1 was paid for the '373 the '759 and all of these other patents?

04:34 2 A. I do not have that specific recollection.

04:34 3 Q. All right. And you can't tell us one way or another
04:34 4 whether the number that's highlighted on the screen is the
04:34 5 amount that in fact has been paid and the only amount that has
04:34 6 been paid?

04:34 7 A. Well, I think we were establishing earlier that there
04:34 8 were other amounts that were paid. But under this amendment, I
04:34 9 cannot validate that for you. That's not my role.

04:34 10 Q. Okay. Now, you said that there might be some other
04:34 11 amounts paid if amounts were recovered under the -- for the
04:34 12 patents, correct?

04:34 13 A. If there are royalties or other payments made for the
04:35 14 patents, then yes. My understanding is that a substantial
04:35 15 share of that goes to NXP.

04:35 16 Q. And amounts go to other folks as well, correct?

04:35 17 A. Oh, I do recall some testimony earlier in this case
04:35 18 on that point.

04:35 19 Q. Well, I'm not going to ask you about the other folks
04:35 20 because I'm going to come to that in Mr. Stolarski's deposition
04:35 21 testimony.

04:35 22 But I am going to ask you this: It's true, is it not,
04:35 23 that Mr. Stolarski, who was here on Monday, gets 3.5 percent of
04:35 24 the recovery, of any amounts recovered, for the patents
04:35 25 licensed to VLSI -- sold by NXP to VLSI?

04:35 1 Let me state it again so it's clear on the record.

04:35 2 It's true, is it not, that Mr. Stolarski gets 3.5 percent
04:35 3 of any recovery under the two patents that are in litigation
04:36 4 here, correct?

04:36 5 A. I do not know.

04:36 6 Q. All right. You have -- you've read his deposition
04:36 7 and you still don't know that?

04:36 8 A. That is correct.

04:36 9 Q. 3.5 percent of the damages number you gave to the
04:36 10 jurors would be a very, very large number, correct?

04:36 11 MS. PROCTOR: And I want to object that that misstates the
04:36 12 record and mischaracterizes the evidence. And the prior
04:36 13 question as well.

04:36 14 THE COURT: I don't know what record it misstates.

04:36 15 MS. PROCTOR: He's misstating the documents relating to
04:36 16 Mr. Stolarski's --

04:36 17 THE COURT: Well, if so, you can clarify that with the
04:36 18 witness on cross.

04:36 19 BY MR. LEE:

04:36 20 Q. The best person to hear about this from would be
04:36 21 Mr. Stolarski, right?

04:36 22 A. I do not know.

04:36 23 Q. Now, I just want to correct one thing. I think you
04:36 24 asked me about Mr. Waxler at NXP. And I think I may have
04:37 25 suggested that he was at NXP at the time of his deposition. To

04:37 1 be accurate, he had been at NXP but was no longer there, but
04:37 2 that doesn't change the answers to your questions, correct?

04:37 3 A. No.

04:37 4 MR. LEE: Okay. Thank you, Your Honor. Nothing further.

04:37 5 THE COURT: Redirect?

04:37 6 MS. PROCTOR: Thank you, Your Honor.

04:37 7 REDIRECT EXAMINATION

04:37 8 BY MS. PROCTOR:

04:37 9 Q. Hi, Dr. Sullivan.

04:37 10 A. Good afternoon.

04:37 11 Q. So can we go back to your Slide 712, and maybe
04:38 12 Mr. Simmons can help us pull that up.

04:38 13 And I believe you were asked about -- this is the slide on
04:38 14 the Georgia-Pacific factors. There we go. I believe you were
04:38 15 asked about Factor 10. Do you recall that?

04:38 16 A. Yes. I do.

04:38 17 Q. And what is covered by Factor 10 of the
04:38 18 Georgia-Pacific factors?

04:38 19 A. Well, the last part of it, I think, is the most
04:38 20 telling. It is the benefits to those who have used the
04:38 21 invention, and here that -- those who have used the invention
04:38 22 as alleged is Intel, and, thus, Factor 10 is relating to the
04:38 23 use of the invention by Intel.

04:38 24 Q. So Factor 10 is not limited to uses by the licensor?

04:38 25 A. Correct.

04:38 1 Q. And what does the statute tell us about which uses
04:38 2 are relevant in calculating damages here?

04:38 3 A. According to --

04:38 4 MR. LEE: Your Honor, I object, Your Honor. This is a
04:39 5 legal question. What does the statute tell us? That's for
04:39 6 Your Honor, not for the witness.

04:39 7 THE COURT: Could you rephrase the question?

04:39 8 MS. PROCTOR: Sure.

04:39 9 BY MS. PROCTOR:

04:39 10 Q. You testified earlier that your -- that your
04:39 11 calculation of damages is based on the use of the invention to
04:39 12 Intel; is that right?

04:39 13 A. Yes. So I have performed damages analyses and
04:39 14 reasonable royalties in many cases, and my understanding is
04:39 15 that the proper framework is to evaluate the royalty based upon
04:39 16 the use of the technology by the alleged infringer.

04:39 17 Q. So in your view, the relevant benefit here is the
04:39 18 benefit that Intel's obtaining from this technology?

04:39 19 A. Yes. Exactly.

04:39 20 Q. And in your experience, is the purchase price of a
04:39 21 patent relevant to a proper damages analysis?

04:39 22 A. Typically not. Because a purchase does not reflect
04:40 23 the use of the technology by another entity, and in particular
04:40 24 recognizing that in many or most instances that information is
04:40 25 highly confidential is not known.

04:40 1 Whether there's infringement, the likelihood of
04:40 2 infringement, the extent of use, which products, what the sales
04:40 3 are, all of those things are confidential. So patent purchases
04:40 4 typically do not reflect that kind of value.

04:40 5 Q. So, for example, Mr. Lee asked you about some patent
04:40 6 acquisition documents. Do you remember that?

04:40 7 A. Yes.

04:40 8 Q. And at the time of those agreements, did NXP have
04:40 9 evidence about the value of Intel's use of the '373 and '759
04:40 10 patents?

04:40 11 A. No. That would not be available because again, that
04:41 12 would be based upon confidential information of Intel that is
04:41 13 only available through, you know, a court proceeding such as
04:41 14 this and it's still maintained confidential.

04:41 15 Q. So that's right actually. We here in this room,
04:41 16 especially those of us who can see the screen, know things that
04:41 17 even NXP does not know to this day, right?

04:41 18 A. That is correct.

04:41 19 Q. And in fact, no one from NXP is allowed to see the
04:41 20 screens that the jury is seeing today, right?

04:41 21 A. That is my understanding.

04:41 22 Q. And so is it fair to say that a patent acquisition
04:41 23 deal like that where there's no actual ability to access
04:41 24 confidential information about the patent's value is akin to
04:41 25 that rookie contract you were talking about?

04:41 1 A. Yes. I think the analogy with Tom Brady and Patrick
04:41 2 Mahomes is reasonably fitting for the situation.

04:41 3 Q. So I want to go back and talk just a little bit
04:42 4 briefly about your regression analysis again. Has regression
04:42 5 analysis generally been used in connection with real-world
04:42 6 licensing negotiations?

04:42 7 A. Yes. It has. Now I have used, personally used
04:42 8 regression analysis in helping companies with their license
04:42 9 negotiations and entering into agreements at least a dozen
04:42 10 times and, you know, I recognize -- I'm an economist so that's
04:42 11 often what I'm called upon to do.

04:42 12 I do recognize that across all licensing negotiations
04:42 13 that's not typical, because oftentimes there's not access to
04:42 14 the confidential information or the market data that would be
04:42 15 necessary as inputs to that type of an analysis.

04:42 16 Q. So oftentimes in a licensing negotiation you wouldn't
04:42 17 have access to the information you would need to do the type of
04:43 18 regression analysis that you did here; is that right?

04:43 19 A. That's right.

04:43 20 Q. And your regression model absolutely relies on
04:43 21 confidential Intel materials that, as we said, are still not
04:43 22 available to companies like NXP, right?

04:43 23 A. That's right. You know, the key piece of the
04:43 24 regression is built upon the actual sales transactions, the 6.5
04:43 25 million sales transactions from Intel's data, and that is

04:43 1 highly confidential to Intel and that is not available, you
04:43 2 know, outside of this.

04:43 3 Q. And is that why when you testified earlier that you
04:43 4 weren't surprised that certain people may not have been able to
04:43 5 use regression in their licensing negotiations? Is that why
04:43 6 it's related to the confidential information and the access to
04:43 7 that?

04:43 8 A. That is a key piece of it.

04:43 9 Q. So in connection with your specific regression,
04:44 10 Mr. Lee showed you a number of features and suggested that you
04:44 11 didn't consider certain of those features like Speed Shift. Do
04:44 12 you remember that?

04:44 13 A. I do.

04:44 14 Q. And is that accurate?

04:44 15 A. No. That's not accurate. You know, clearly I
04:44 16 considered all of these features.

04:44 17 It -- you'll probably recall from my testimony earlier
04:44 18 today that it would not be appropriate to include the feature,
04:44 19 Speed Shift, along with the benefit of the feature. If you do
04:44 20 so, that's double counting and that results in duplicative
04:44 21 effects and thus dilutes the effect.

04:44 22 It's, you know, very similar to the car analogy where if
04:44 23 you have the lightning bolt technology, customers care about
04:44 24 the benefits, not the lightning bolt itself. All right? So
04:44 25 one -- the right way to measure its benefits is to look at the

04:44 1 benefits it has on fuel efficiency, on price, which is in
04:45 2 effect how I went about my analysis here.

04:45 3 Q. So in your analysis here, you focused on valuing the
04:45 4 benefits that the patents provide to Intel's products?

04:45 5 A. Exactly. Customers care about the benefits, and
04:45 6 that's the focus of the work that I did.

04:45 7 Q. Now, Mr. Lee also asked about some nonaccused
04:45 8 features that you included in your regression. Why did you
04:45 9 include features that are not accused of infringement in that
04:45 10 regression model that you built?

04:45 11 A. Well, it's essential to do so because I wanted to
04:45 12 separate out the effects of clock speed and the benefits of the
04:45 13 technology separate and apart from all of the other features
04:45 14 and functionalities.

04:45 15 I precisely did that so that when I developed the
04:45 16 royalties, it's isolated just to the benefits of the
04:45 17 technology. And you can see that in part because there's the
04:46 18 coefficient on clock speed, and then I have, you know, the
04:46 19 non-accused, you know, functionalities.

04:46 20 But not only that, I only then apply the results, you
04:46 21 know, that coefficient of 0.764 to -- only to the sales of the
04:46 22 accused products, right? So it's limited to the accused
04:46 23 products, so I take that result and narrowly apply it.

04:46 24 Q. So you included some of those nonaccused features in
04:46 25 the model as control factors just so that you could make sure

04:46 1 that you weren't counting them in your damages; is that fair?

04:46 2 A. Exactly.

04:46 3 Q. Now, just to be super clear on that point, do the
04:46 4 ultimate damages you calculated here as reasonable royalties
04:46 5 actually include value from those nonaccused features?

04:46 6 A. No. And that's by design. By using the benefits of
04:46 7 the patents as determined by Professors Conte and Annavaram, by
04:47 8 using the coefficient on clock speed, those items ensure that
04:47 9 the royalty is isolated to the benefits of the patented
04:47 10 technology separate and apart from all other features and
04:47 11 functionalities.

04:47 12 Q. Thank you.

04:47 13 You were also asked some questions about real-world
04:47 14 licenses. Are there any differences between negotiating in the
04:47 15 real world and negotiating in the hypothetical negotiation, or
04:47 16 in calculating damages in the hypothetical negotiation?

04:47 17 A. There's a number of differences. I think one of the
04:47 18 key differences is that at the hypothetical negotiation for
04:47 19 that damages framework, as I mentioned earlier, it's as if one
04:47 20 is playing cards with all of the cards face up where everybody
04:47 21 knows all of the information, and, of course, in a real-world
04:47 22 negotiation, the parties are holding their cards very close to
04:48 23 the vest so that that information isn't known. And they try to
04:48 24 use those information differences to gain an advantage in the
04:48 25 negotiation.

04:48 1 But here, when calculating a reasonable royalty, that
04:48 2 information is all known to the parties.

04:48 3 Q. So here, what real-world facts do you think are most
04:48 4 relevant to calculating a reasonable royalty?

04:48 5 A. Well, I think there's several. You know, in my view,
04:48 6 looking at the tested benefits of the technology, that
04:48 7 allows -- that uses Intel's confidential information to
04:48 8 identify specifically the benefits of the technology,
04:48 9 technically speaking.

04:48 10 Secondly is the actual sales data. And that enables a
04:48 11 determination of what the effect is on price and then being
04:48 12 able to use, again, the -- you know, the financial data to
04:48 13 determine the appropriate adjustments for costs and relative
04:49 14 contributions, and ultimately what that provides is a
04:49 15 determination of what is the value to Intel as a result of
04:49 16 using the technology specific to this technology.

04:49 17 MS. PROCTOR: Okay. I'll pass the witness.

04:49 18 Thank you, Dr. Sullivan.

04:49 19 THE COURT: Mr. Lee?

04:49 20 RE CROSS-EXAMINATION

04:49 21 BY MR. LEE:

04:49 22 Q. Just a few questions, Dr. Sullivan.

04:49 23 MR. LEE: Could I have PDX-7.12 on the screen?

04:49 24 BY MR. LEE:

04:49 25 Q. It's your Georgia-Pacific chart.

04:49 1 Are you with us?

04:50 2 A. Yes.

04:50 3 Q. So I want to examine your testimony about the
04:50 4 relevance of real-world agreements to the hypothetical
04:50 5 negotiation you just talked about with Ms. Proctor, correct?

04:50 6 A. I did.

04:50 7 Q. Georgia-Pacific Factor No. 1: "The royalties
04:50 8 received by the patentee for the licensing of the
04:50 9 patent-in-suit proving or tending to prove an established
04:50 10 royalty." Have I read that correctly?

04:50 11 A. You did.

04:50 12 Q. That's referring to real-world agreements, isn't it?

04:50 13 A. It's referring to royalties, if they exist. That
04:50 14 would be received by the patent holder.

04:50 15 Q. Real-world agreements?

04:50 16 A. It can be, yes.

04:50 17 Q. Georgia-Pacific Factor No. 2: "The rates paid by the
04:50 18 licensee for the use of other patents comparable to the
04:50 19 patent-in-suit," that refers to real-world agreements, doesn't
04:50 20 it?

04:50 21 A. Real-world royalty rates.

04:51 22 Q. Now, if we go down to No. 8: "The established
04:51 23 profitability of the product made under the patent, the
04:51 24 commercial success, and its current popularity."

04:51 25 Do you see that?

04:51 1 A. Yes, I do.

04:51 2 Q. That's not limited to the accused infringer, is it?

04:51 3 A. Not limited. But it's certainly relevant.

04:51 4 Q. Right. And it doesn't exclude the patent owner, does
04:51 5 it?

04:51 6 A. Not necessarily.

04:51 7 Q. And if I go to No. 9, "the utility and advantages of
04:51 8 the patent property over the old modes and devices, if any,
04:51 9 that had been used for working out similar results." Do you
04:51 10 have that in mind?

04:51 11 A. I do.

04:51 12 Q. That is a reference to real-world utility and
04:51 13 advantages of the patent, correct?

04:51 14 A. Yes. Exactly like--

04:51 15 Q. It's not limited to the accused infringer, correct?

04:51 16 A. I'm sorry. I did not hear.

04:51 17 Q. It's not limited to the accused infringer, correct?

04:51 18 A. Not limited. No.

04:51 19 Q. It could include the patent owner, correct?

04:52 20 A. It could. In theory.

04:52 21 Q. And Georgia-Pacific Factor No. 10 refers explicitly
04:52 22 to products or -- withdrawn.

04:52 23 It refers explicitly to the commercial embodiment as owned
04:52 24 and produced by the licensor, correct?

04:52 25 A. Yes. That's right.

04:52 1 Q. That's the patent owner, correct?

04:52 2 A. Yes.

04:52 3 Q. So we've looked at five of the Georgia-Pacific
04:52 4 Factors that don't exclude activity by the patent owner, do
04:52 5 they?

04:52 6 A. That's right.

04:52 7 Q. And that referred to events occurring in the real
04:52 8 world with real products and real agreements, correct?

04:52 9 A. All except for the last part, but yes.

04:52 10 MR. LEE: Okay. Nothing further, Your Honor.

04:52 11 FURTHER REDIRECT EXAMINATION

04:52 12 BY MS. PROCTOR:

04:53 13 Q. Very briefly, Dr. Sullivan. Thank you for your
04:53 14 patience.

04:53 15 MS. PROCTOR: Can we pull up the Georgia-Pacific factors
04:53 16 one more time?

04:53 17 BY MS. PROCTOR:

04:53 18 Q. So on Georgia-Pacific Factor 1, were there any
04:53 19 licenses that were relevant under this factor here?

04:53 20 A. No.

04:53 21 Q. And under Georgia-Pacific Factor 2, were there any
04:53 22 agreements that Intel looked at that you found to be comparable
04:53 23 here?

04:53 24 A. No.

04:53 25 Q. And as we talked about already on Georgia-Pacific

04:53 1 Factor 10, the last bit there is the benefits to those who have
04:53 2 used the invention, right?

04:53 3 A. Yes.

04:53 4 Q. And in this case, of course, that's Intel, right?

04:53 5 A. That's right.

04:53 6 Q. And, Dr. Sullivan, in all of your analysis that we've
04:53 7 talked about this afternoon, did you consider all of the
04:53 8 Georgia-Pacific factors and all the relevant evidence under
04:53 9 each of those factors?

04:53 10 A. Yes. I did.

04:53 11 Q. Thank you, Dr. Sullivan.

04:53 12 FURTHER RECROSS-EXAMINATION

04:53 13 BY MR. LEE:

04:54 14 Q. Just one more question.

04:54 15 MR. LEE: If we could keep that on the screen.

04:54 16 THE COURT: I'm willing to bet it's not just one more
04:54 17 question.

04:54 18 (Laughter.)

04:54 19 THE COURT: But I'll --

04:54 20 MR. LEE: I'm going to take that bet so I can win it.

04:54 21 BY MR. LEE:

04:54 22 Q. Dr. Sullivan, Mr. Huston disagrees with you on the
04:54 23 question of whether there are license agreements that are
04:54 24 relevant under Georgia-Pacific Factor No. 1, correct?

04:54 25 A. He does under Factor 2, but I don't recall the

04:54 1 disagreement under Factor 1 at the moment.

04:54 2 MR. LEE: He'll be here to testify. Nothing further, Your
04:54 3 Honor.

04:54 4 THE COURT: Good job.

04:54 5 Anything else for, Dr. Sullivan?

04:54 6 MS. PROCTOR: No, Your Honor.

04:54 7 THE COURT: Dr. Sullivan, you may step down.

04:54 8 Ladies and gentlemen of the jury, we are going to recess
04:54 9 for the evening. Is there any problem with starting tomorrow
04:55 10 morning at 9 o'clock?

04:55 11 If not, then remembering my instructions not to discuss
04:55 12 the case amongst yourselves or, since you're going home, with
04:55 13 anyone else. I'll see you tomorrow. Hopefully if you'll be
04:55 14 here by 8:45, that would be great.

04:55 15 THE BAILIFF: All rise.

04:55 16 (Jury exited the courtroom at 4:55.)

04:55 17 THE COURT: Thank you. You may be seated.

04:55 18 A couple of things. Housekeeping.

04:55 19 One is, we are going to do the jury charge Friday
04:55 20 afternoon after we finish with the trial day. I always hated
04:55 21 it when I was in trial and the judge made me come sit and work
04:55 22 on the jury charge while I thought maybe I could be getting
04:56 23 ready for the next day in trial, so I'm trying to avoid that
04:56 24 for you all. And so that's why I'm doing it Friday afternoon
04:56 25 as opposed to tomorrow.

04:56 1 Number two, the plaintiffs, by our calculation, have used
04:56 2 six hours and 26 minutes. The defendant has used four hours
04:56 3 and 19 minutes is what we show. If tomorrow you tell me that
04:56 4 there's a substantial discrepancy, let me know.

04:56 5 But it appears to me that the plaintiff has only used six
04:56 6 hours and 26 minutes at this point, and you're essentially done
04:56 7 with your case-in-chief. Doesn't look to me like anyone's in
04:56 8 great peril of running out of time with the amount of time I
04:56 9 gave you for trial, so I don't know that it's that big a deal
04:56 10 one way or the other.

04:56 11 So having said that, let me start with the plaintiff.

04:56 12 Mr. Chu, is there anything we need to take up this evening
04:56 13 before we part?

04:56 14 MR. CHU: Nothing further, Your Honor. Thank you.

04:56 15 THE COURT: I love the jacket. I think that's a good
04:57 16 look.

04:57 17 MR. LEE: Oh, two things, Your Honor. Mr. Mueller should
04:57 18 deal with the exhibit question that came up earlier today, just
04:57 19 for the record.

04:57 20 THE COURT: Okay.

04:57 21 MR. LEE: But this relates to the 255 case and I'm sure
04:57 22 that --

04:57 23 (Clarification by Reporter.)

04:57 24 THE COURT: Why don't you come to the podium?

04:57 25 MR. LEE: Okay. Your Honor, this deals with the motion to

04:57 1 transfer in the 255 case, and I'm sure they haven't had a
04:57 2 chance to address it, but we'd like to get an extension to
04:57 3 March 10th to respond, only because we're here working on this
04:57 4 case.

04:57 5 THE COURT: I don't have a problem with that if they don't
04:57 6 have a problem with that.

04:57 7 MR. CHU: We do have a problem.

04:57 8 THE COURT: Okay.

04:57 9 MR. CHU: The basis for the motion, as well as their
04:57 10 opposition, has been briefed multiple times. It's the same
04:57 11 issues.

04:57 12 THE COURT: Yeah. Let me interrupt you, Mr. Chu. Is this
04:57 13 motion to transfer the April setting?

04:58 14 MR. CHU: Yes.

04:58 15 THE COURT: I'll double-check, Mr. Lee, but I don't think
04:58 16 Austin is open in April. I think they've already made that
04:58 17 decision. I think that's correct.

04:58 18 If you all know that that's incorrect, let me know. But
04:58 19 the most recent order I saw -- and I am pretty certain they're
04:58 20 closed in April. And I am pretty certain that they have not
04:58 21 yet decided if and when -- that's the wrong word -- that they
04:58 22 have not decided when they will resume having trials in Austin.

04:58 23 MR. LEE: Your Honor, I don't disagree with Mr. Chu that
04:58 24 the basic issues have been briefed before. I also expect that
04:58 25 we will -- the briefs will be very similar to what you've seen

04:58 1 before. And I expect the ruling will be, if Austin's closed,
04:58 2 what we've seen before. We'd just like a little extra time to
04:58 3 do it because we're in trial.

04:59 4 THE COURT: I understand.

04:59 5 Mr. Chu, I will forecast for you that what Mr. Lee just
04:59 6 predicted is accurate, that if I'm correct that the Austin
04:59 7 court is not going to be open in April and they are not able to
04:59 8 say that they'll be open immediately after April, given what
04:59 9 I've decided in the past, I can assure you that the resolution,
04:59 10 you may not need to file a reply. Or I'll know -- I mean, it's
04:59 11 their reply -- maybe it's -- you won't need to file a rebuttal.

04:59 12 MR. CHU: Here's our concern, Your Honor.

04:59 13 THE COURT: Okay.

04:59 14 MR. CHU: We think there is at least the tiny possibility
04:59 15 that Intel will run to the Federal Circuit. There's some data
04:59 16 in this particular litigation between the parties. And then as
04:59 17 a result of that, the current trial date gets delayed. They --
04:59 18 as a practical matter, 99 times out of 100, I am always willing
05:00 19 to grant reasonable extensions.

05:00 20 THE COURT: I understand.

05:00 21 MR. CHU: But this is an old motion that they have filed
05:00 22 twice in this Court, went to the Federal Circuit twice, and
05:00 23 they've shown the capacity to do the full briefing in 24 hours.

05:00 24 THE COURT: Can you tell me when we're set for trial in
05:00 25 April? I know we are, but I don't know.

05:00 1 MR. CHU: April 12, I believe.

05:00 2 THE COURT: Mr. Lee, I don't want to be obstreperous here.
05:00 3 I understand you're in trial. But Mr. Chu makes a pretty good
05:00 4 point that if I deny it -- let's say I do deny the motion on
05:00 5 March 16th, and to protect your client you go to the Federal
05:00 6 Circuit. I am worried if I wait till then that it may disturb
05:00 7 our trial setting here.

05:00 8 MR. LEE: Your Honor, I can represent to you that if there
05:00 9 are no changed circumstances -- we understand what Your Honor's
05:01 10 ruling will be. And if there are no changed circumstances, I'm
05:01 11 not going to file a petition for a mandamus.

05:01 12 Now, the only reason I say it that way is something could
05:01 13 happen. I doubt that it will, but that's not our intention.
05:01 14 Our intention is to propose the motion because we have to for
05:01 15 the record, but we expect to be on trial before Your Honor on
05:01 16 April the 12th.

05:01 17 THE COURT: Very good. I'm satisfied with that
05:01 18 representation because -- let me do this.

05:01 19 Let me -- before -- Mr. Lee, before I grant your motion,
05:01 20 let me find out from Austin what the status is of the Austin
05:01 21 courthouse. And that way that will be -- I see it as a
05:01 22 two-step deal. You all can tell me if you see it differently.

05:01 23 The concern -- the reason we're having the case now here
05:01 24 in Waco was not only because the Austin courthouse was
05:01 25 unavailable in January and in February, but they couldn't tell

05:02 1 me with any certainty when it would be reopened. I'm 99
05:02 2 percent sure it will be closed in April. And as best I can
05:02 3 tell, they won't be able to tell me when it's going to reopen.

05:02 4 And under those two circumstances, I would definitely
05:02 5 continue the trial in Waco on the 12th. And I would be -- if I
05:02 6 grant this, unlike the last time, this time I probably would be
05:02 7 very unhappy if you went to the Circuit. I heard what you
05:02 8 said. I don't anticipate you will. But this time I might be
05:02 9 more concerned about Intel going to the Circuit if it's an
05:02 10 identical situation that the Circuit has already addressed.

05:02 11 So with that being said, let me try and find out overnight
05:02 12 what the status is in Austin. If it is as I believe it is, I'm
05:02 13 going to grant Intel the extension of time to file the motion
05:03 14 or pleading, whatever it is, but Intel should expect the same
05:03 15 ruling as there was in this case if the circumstances are the
05:03 16 same.

05:03 17 Yes, sir.

05:03 18 MR. CHU: Not necessarily to do it right at this instance,
05:03 19 because we had no notice that this exact issue comes up. If we
05:03 20 could reserve a response until tomorrow morning in terms of if
05:03 21 the circumstances Your Honor just described are in fact true,
05:03 22 then what a reasonable date would be in terms of their
05:03 23 responding. And obviously of course what Your Honor learns
05:03 24 between now and tomorrow may have an impact.

05:03 25 THE COURT: Okay. Anything else?

05:03 1 MR. CHU: Not for me.

05:03 2 THE COURT: Yes, sir.

05:03 3 MR. MUELLER: Yes, Your Honor. Just briefly on the
05:03 4 exhibits.

05:03 5 THE COURT: Oh, please.

05:03 6 MR. MUELLER: And, Your Honor, this is with respect to the
05:03 7 list that was read this morning before we started.

05:03 8 THE COURT: Oh, good.

05:03 9 MR. MUELLER: We had two.

05:04 10 THE COURT: It's sad when you have to remind me of what
05:04 11 you did this morning and I truly had not remembered it.

05:04 12 MR. MUELLER: No problem.

05:04 13 THE COURT: It's been a long day.

05:04 14 MR. MUELLER: So, Your Honor, there's two issues.

05:04 15 Number one is there were two exhibits that we could not
05:04 16 find referred to on the record during the testimony. I'll read
05:04 17 those two.

05:04 18 The first one is PTX-1696. The second is PTX-3851. And
05:04 19 my understanding is our team notified their team and asked for
05:04 20 a transcript cite, and we haven't received it yet. So those
05:04 21 two we don't think should be admitted until we have some clear
05:04 22 indication that they were used.

05:04 23 THE COURT: And let me hear from -- do you have any reason
05:04 24 to believe that --

05:04 25 MR. HEINRICH: So PTX-1696 was addressed by Dr. Conte, but

05:04 1 we didn't call out that particular exhibit number. It was on
05:04 2 the slide but not stated. And I do believe -- I need to
05:05 3 confirm, but I do believe 3851 was in error. So I think
05:05 4 there's just one at issue.

05:05 5 THE COURT: Well, if the doctor discussed it without
05:05 6 objection -- a slide without objection that referred to an
05:05 7 exhibit, then I'm going to admit that exhibit.

05:05 8 MR. HEINRICH: Okay.

05:05 9 THE COURT: Assuming that's correct, if the jury's heard a
05:05 10 discussion of a slide that was derived from an exhibit and
05:05 11 there was no objection to the slide, I'm going to admit the
05:05 12 exhibit.

05:05 13 MR. MUELLER: And, Your Honor, the other three were
05:05 14 exhibits that were used on cross-examination of Dr. Conte. We
05:05 15 would ask that these be added to the list of admitted exhibits.
05:05 16 And those are DX-249, DX-517 and PTX-1590, and I have page
05:05 17 citations, if necessary, to where those were used.

05:06 18 MR. HEINRICH: We have no objections.

05:06 19 THE COURT: There you go.

05:06 20 MR. MUELLER: Thank you, Your Honor.

05:06 21 THE COURT: Winning.

05:06 22 (Laughter.)

05:06 23 THE COURT: Is there anything that we need to take up,
05:06 24 Mr. Lee?

05:06 25 MR. LEE: No, Your Honor.

05:06 1 THE COURT: Mr. Chu?

05:06 2 MR. CHU: No, Your Honor. Thank you.

05:06 3 THE COURT: Okay. I hope to see that jacket tomorrow.

05:06 4 (Hearing adjourned at 5:06 p.m.)

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1 UNITED STATES DISTRICT COURT)
2 WESTERN DISTRICT OF TEXAS)
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4 I, Kristie M. Davis, Official Court Reporter for the
5 United States District Court, Western District of Texas, do
6 certify that the foregoing is a correct transcript from the
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8 I certify that the transcript fees and format comply with
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11 Certified to by me this 8th day of March 2021.

12
13 /s/ Kristie M. Davis
14 KRISTIE M. DAVIS
15 Official Court Reporter
16 800 Franklin Avenue
17 Waco, Texas 76701
18 (254) 340-6114
19 kmdaviscsr@yahoo.com
20
21
22
23
24
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